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THE South African MINING JOURNAL

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"INDUSTRY AS USUAL."

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GINSBERG GOLD MINING CO., LIMITED.

(Incorporated in the Transvaal.)

NOTICE TO SHAREHOLDERS.

INTERIM DIVIDEND No. 26.

NOTICE IS HEREBY GIVEN that an Interim Dividend of Seven and One-half per centum. (One Shilling and Sixpence per share), has been declared payable to Shareholders registered at the 30th June, 1916, as soon as the necessary returns are received from the London Office.

The Transfer Books will be closed from the 1st to the 10th July, 1916, both days inclusive.

By Order of the Board,

Johannesburg Consolidated Investment Co., Ltd., Secretaries.
Per FRANK HALL.

Head Office: Consolidated Buildings
(P.O. Box 590), Johannesburg,
20th June, 1916.

New Primrose Gold Mining Co., LIMITED

(Incorporated in the Transvaal.)

NOTICE TO SHAREHOLDERS.

INTERIM DIVIDEND No. 46.

NOTICE IS HEREBY GIVEN that an Interim Dividend of Five per centum. (One Shilling per share), has been declared payable to Shareholders registered at the 30th June, 1916, as soon as the necessary returns are received from the London Office.

The Transfer Books will be closed from the 1st to the 10th July, 1916, both days inclusive.

By Order of the Board,

Johannesburg Consolidated Investment Co., Ltd., Secretaries.
Per FRANK HALL.

Head Office: Consolidated Building
(P.O. Box 590), Johannesburg,
20th June, 1916.

Consolidated Langlaagte Mines, LIMITED.

(Incorporated in the Transvaal.)

NOTICE TO SHAREHOLDERS.

INTERIM DIVIDEND No. 6.

NOTICE IS HEREBY GIVEN that an Interim Dividend of Twelve and One half per centum. (Two Shillings and Sixpence per share), has been declared payable to Shareholders registered at the 30th June, 1916, as soon as the necessary returns are received from the London Office.

The Transfer Books will be closed from the 1st to the 10th July, 1916, both days inclusive.

By Order of the Board,

Johannesburg Consolidated Investment Co., Ltd., Secretaries.
Per FRANK HALL.

Head Office: Consolidated Buildings
(P.O. Box 590), Johannesburg,
20th June, 1916.

New Unified Main Reef GOLD MINING COMPANY, LTD.

(Incorporated in the Transvaal.)

NOTICE TO SHAREHOLDERS.

INTERIM DIVIDEND No. 16.

NOTICE IS HEREBY GIVEN that an Interim Dividend of Ten per centum. (Two Shillings per share) has been declared payable to Shareholders registered at the 30th June, 1916, as soon as the necessary returns are received from the London Office.

The Transfer Books will be closed from the 1st to the 10th July, 1916, both days inclusive.

By Order of the Board,

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Per FRANK HALL.

Head Office: Consolidated Building
(P.O. Box 590), Johannesburg,
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VAN RYN DEEP, LIMITED.

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NOTICE TO SHAREHOLDERS.

INTERIM DIVIDEND No. 6.

NOTICE IS HEREBY GIVEN that an Interim Dividend of Twenty per centum. (Four Shillings per share), has been declared payable to Shareholders registered at the 30th June, 1916, as soon as the necessary returns are received from the London Office.

The Transfer Books will be closed from the 1st to the 10th July, 1916, both days inclusive.

By Order of the Board,

Johannesburg Consolidated Investment Co., Ltd., Secretaries.
Per FRANK HALL.

Head Office: Consolidated Buildings,
(P.O. Box 590), Johannesburg,
20th June, 1916.

Witwatersrand Gold Mining COMPANY, LIMITED.

(Incorporated in the Transvaal.)

NOTICE TO SHAREHOLDERS.

INTERIM DIVIDEND No. 24.

NOTICE IS HEREBY GIVEN that an Interim Dividend of Twenty-Five per centum. (Five Shillings per share), has been declared payable to Shareholders registered at the 30th June, 1916, as soon as the necessary returns are received from the London Office.

The Transfer Books will be closed from the 1st to the 10th July, 1916, both days inclusive.

By Order of the Board,

Johannesburg Consolidated Investment Co., Ltd., Secretaries.
Per FRANK HALL.

Head Office: Consolidated Buildings
(P.O. Box 590), Johannesburg,
20th June, 1916.

Engineering Works and Foundries.

THE SOUTH AFRICAN

Mining Journal,

WITH WHICH IS INCORPORATED

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NOTICE.—The postage of this issue of the *S.A. Mining Journal* is: South Africa, 1d. All other parts, 2d.

CONTENTS.

Notes and News

The Coal Trust Scheme Carried.

The special Coal Trust meeting, to consider the agreement with the "C.M.S." Company, and the change of name, was held yesterday. The proceedings were too lengthy to admit of reporting in this issue, but a full account will be printed next week. Mr. F. E. Lynch presided, and introduced the resolutions in a brief, but explicit speech. Sir George Albu opposed, but after some remarks from other shareholders, the resolutions were carried. In favour of the proposals there were present and represented by proxy 241,886 shares, and against this were 38,373 shares. Of the latter 25,000 were shares held in South Africa.

* * * *

Industries and Population.

The full report that appeared in our last issue of the proceedings at the special meeting to consider the question of scientific research and industrial development, has greatly stimulated public interest, and promises to have an excellent effect. A correspondent in our last issue drew attention to the fact that the absence of a white population, by limiting markets in the country, was at the root of the failures of most of our infant industries. This is the very difficulty, of course, that the sponsors of the new movement are seeking to overcome. Their efforts are directed to making the country more attractive to an increased white population, as it is recognised that to dump more people down in South Africa, without having, in advance, provided them with employment and the means of livelihood, is simply courting disaster. An interesting discussion on the whole subject is anticipated on the paper to be read by Professor Lehfeldt at the School of Mines on Saturday night.

* * * *

The Bantjes.

The Secretaries wrote under date June 22nd:—"The following telegram has been despatched this afternoon to the London Secretary for publication: 'On representations we are publishing here that the approximate percentage of payability of the estimated tonnage developed in the Leader and Main Reef is 53 per cent. for the ten 100 months ending 31st May, 1916.'"

* * * *

Village Main Reef.

The Village Main Reef annual report shows a net profit of £110,795, of which £14,601 is written off for depreciation, and £245,611 carried forward. The directors recommend an interim dividend of two shillings per share.

* * * *

Gold Mining Dividends.

A prominent feature of the gold mining dividend list for the half-year ending the 30th June, appearing elsewhere in this issue, is the comparatively large number of declarations which fall short of the amounts tabled for the corresponding period of last year. First on the list in order, and notable also for the difference in the rate, is the dividend of the Crown Mines, at 25 per cent as against 35 per cent. for last June; then comes the Durban Roodepoort Deep, with a slight falling off amounting to 1½ per cent., and the East Rand Proprietary Mines, with a descent from 6 ¼to 2½ per cent. The Ferreira Deep, Langlaagte Estate, Rose Deep, Van Ryn, Village Deep, Witwatersrand Deep and the Transvaal Gold Mining Estate, also show small reductions in the declaration as compared with last year. There are, at the same time, some notable increases, as for instance, that of the Brakpan Mines, from 17½ to 22½; City Deep, from 13⅜ to 22½; Geldenhuis Deep, from 10 to 12½; Meyer and Charlton, from 10 to 45; and Modder B, from 32½ to 37½ per cent. The Van Ryn Deep has taken a big leap from 15 per cent, as in June last year to the recent declaration of 20 per cent; while the Wolhuter, at 7½, as compared with 6¼ for the first half-year of 1915, is worthy of reference.

A New Diamond Venture.

We understand that a new company, with a capital of £25,000, is being formed to purchase the assets of the Compound Diamond Prospecting Syndicate, Limited. The new company will be styled the New Compound Diamonds, Limited. A private prospectus will be issued in a day or two, which embodies a full report by Mr. C. F. Goulding, who will be the manager of the new company. The syndicate is prospecting between the New Thor and Lion Hill Mines, and has opened up two diamondiferous areas. Some 250 carats of diamonds of excellent quality have been received from test washing and will be on show at an early date.

* * * *

Physical Conditions of the Main Reef Leader.

It is gratifying to note that Professor R. B. Young, of the Transvaal University College, in his contribution to the discussions on Dr. Mellor's paper on "The Conglomerates of the Witwatersrand," has directed attention to the physical conditions which are associated with the occurrence of the Main Reef Leader, and has left the consideration of its gold contents to those who are more concerned with the arguments of the infiltration and placer theorists respectively. Quite a lot has been written and said with regard to this latter view of the question and comparatively little with reference to the manner in which the conglomerates were deposited. Geological literature relating to the laying down of strata in deltaic areas is somewhat scanty, as Dr. Mellor discovered when he set about searching for data which might have some useful bearing upon the problem which he was endeavouring to solve. The origin of the auriferous contents of the banket beds is naturally a matter of considerable importance to begin with, but if we accept the view of Dr. Mellor and other geologists, who find overwhelming evidence in favour of physical, as against chemical, processes, it becomes equally a matter of importance to learn how these physical processes carried out their work. The question is obviously of more than academic interest as far as it relates to the more or less unexplored field of the Far East Rand, where the existence of discontinuous areas of workable banket instead of the more permanent and all-pervading beds of the Central Rand, is an economic disadvantage which is reflected—to use a much favoured term—in the failure of the Government to secure satisfactory tenders for the opening up of the Eastern goldfields. Whatever be the sounder theory as to the source of the gold, it is generally accepted that the precious metal accompanies the conglomerate under profitable conditions. The real element of uncertainty is introduced when we begin to calculate upon the presence of the conglomerate. Hence it is desirable that the fullest possible light should be thrown upon those points to which Professor Young has drawn particular attention. He says that he experiences some difficulty in accepting Dr. Mellor's views regarding the agency which brought about the peculiar stratification of the Main Reef Leader, and brings forward data which he considers to be sufficient to justify his objections to the "geological episode" theory. The method of deposition has, as has already been remarked in the *S.A. Mining Journal*, a vital bearing upon the occurrence of the ore bodies on the fringes of the Witwatersrand basin, and it is much to be desired that this aspect of the Far Eastern problem will receive the fullest possible consideration.

* * * *

The Diamond Trade.

There was no change to chronicle in diamonds in mail week, the market remaining adversely affected by the political uncertainty in the United States. The *Financial News* says: "Rumours have reached us that the opinion is expressed in responsible quarters that the French Government intend to prohibit the importation of precious stones into France, following in this respect the lead of Russia. The French trade is, of course, of small volume in these days, but such action by the authorities, should it eventuate, will not tend to improve business. From our usually well-informed sources we learn that it is expected that the Diamond business will decline during the next few months; but as the production of the rough article is very small, the market will not lose its strength, provided the producers only supply the very necessary demands, and do not force the cutter to go on buying at the moment. As the demand in the Far East has also very considerably diminished, it is scarcely surprising that dealers and cutters should mark time as regards new purchases. We are informed that the Diamond Syndicate are showing Wesselton and Dutoitspan diamonds towards the end of the month, and we also learn that the Premier Company have received, during the last few weeks, a shipment of debris. We are informed, on good authority from Holland, that the Germans have now disposed of the whole of their stocks of diamonds obtained prior to the war from what was then German South-West Africa, and this should have a powerful influence on the market for small sizes. As is well-known to our readers, melees are the bread-and-butter goods of the trade, and the decline in prices that took place in these qualities when the German goods flooded the market was entirely due to over-production. Now that this factor is removed, and as we feel pretty confident that the Union Government will never at any time flood the market, or work in a manner inimical to the interests of the trade, the demand for this class of goods should shortly greatly improve. The Forestiere Miniere have called for tenders for another 16,000 carats of Congo diamonds on the 5th of next month."

* * * *

Scientific Research.

At the first meeting of the Standing Committee on Metallurgy appointed by the Advisory Council for Scientific and Industrial Research, Sir R. Hadfield, as Chairman of the Ferrous Section, called attention to the necessity for improvement and progress in the metallurgy of iron and steel. Though Great Britain had been far from backward in this field, there was now room for a great extension of research, in which there would be a happy combination of science and practice. The further progress of metallurgy depended largely on the securing of supplies of the special alloys and materials required, and there was now need for a central clearing-house in order that as soon as new knowledge was secured as to valuable products in any part of the Empire, it should be made available for British industry. No foreign control of such products should any longer be permitted. Sir Robert called attention to the series of special reports on the mineral resources of Great Britain now being issued by the Geological Survey, and urged that similar information for the whole Empire should now be made available through one central source. He directed attention to a number of subjects upon which more light was needed—for example, the production of sound steel; the discovery of new alloy steels and the development of the older types; wider study of crystallised structure and examination by photomicrography with increased magnifications; more accurate determinations of high temperatures, including the improvement of electrical and optical pyrometers; the improvement of methods of hardening; the improvement of the permeability and other electrical and magnetic qualities of various alloys, and the correlation of the mechanical and magnetic properties of steel; corrosion refractory materials, especially with a view to rendering ourselves independent of foreign supplies.

* * * *

Oceana Development.

The report of the Oceana Development Company states that the present Board assumed office on 29th November, 1915, in response to the request of a large body of shareholders, primarily with a view to thoroughly investigating the position and presenting the accounts for 1915 at as early a date as possible. In order to deal in the best interests of the company with the numerous intricate transactions entered into in the past, extending over a lengthy period, further considerable time and attention will be necessary, but in the meantime the Board has thought it

desirable to present the accounts to end of 1915 without waiting to complete their investigations, accompanied by a profit and loss account covering the last three years. The directors consider it detrimental that any of its properties should be mortgaged, and with a view to liquidating its obligations, are in communication with the Treasury with the object of obtaining sanction to raise, by an issue of capital, a sufficient sum for that purpose. The authority of the shareholders in general meeting will be required if these negotiations are successful. The question of the responsibility for the heavy losses incurred in advances to other concerns, and in investments of a highly speculative nature, is at present under legal consideration. The complicated relations existing between the company and the Orion Development Company, in which this company holds 80 per cent. of the issued capital, are in course of being straightened out, and the interests of the respective concerns placed on a proper basis. Five of the freehold properties in the Transvaal are pledged as security for loans amounting, at 31st December, 1915, to £10,100, which have since been reduced by £500. There has recently been a marked revival of interest in properties situated in the Far Eastern Rand, and the directors have reason to believe that the two farms, Eendracht and Koppieskraal, in that district, possess an important potential mining value which should materially increase as development on adjacent properties is carried out. The expenditure in connection with Congo Concessions shows on adjustment of the accounts a slight increase, and now stands at £10,482. The directors are unable to express any opinion as to the value of this concession, and it is improbable that any steps can be taken to prove its value until the termination of hostilities. In February last the directors issued a circular inviting the nomination as directors of shareholders holding the requisite qualification. Three names were received in reply to the circular: Mr. Walter Butler Stonebridge, M.S.A., L.R.I.B.A., holding 250 shares; Mr. James Henry White, holding 450 shares; and Mr. William Beeson, who has since disposed of his holding. The present directors, Messrs. H. C. Emery, F. C. Bromhead and S. S. Kennedy, have decided to place their resignations at the disposal of shareholders.

* * * *

Mining Engineers on Service.

Among the mining engineers who have distinguished themselves in the war, the *Mining and Scientifi Press*, enumerates Ralph Stokes, formerly at Johannesburg and later with the Canadian Exploration Company in New York; enlisting at the beginning of the war, he is now captain and has received the Military Cross. W. S. Holloway, formerly manager of the Gwendoline Mine in Korea, serving as lieutenant in the Royal Engineers, has received the same decoration "for conspicuous gallantry." This cross of honour has also been awarded on proof of similar courage and intelligence to Herbert Eyden, H. C. B. Hickling, Arthur Hibbert, Hugh R. Kerr, and H. R. Ruggles-Brise, all of whom are lieutenants, and to Laurence C. Hill, Lionel E. Hill, Stuart G. Love, R. S. Mackilligin, and C. M. Euan Smith, all captains. Also to Major G. W. Laws, who has received, in addition, the Croix de Guerre from the French. J. Norton Griffiths, well known in South Africa, has been awarded the D.S.O., and is a major. Of all of these men the profession may well be proud. Among the mining engineers from the other side of the Atlantic summoned by the call of duty to military service are the following: F. K. Borrow and Harold Rickard, both formerly in Colorado; Fred. B. Reece and J. H. Fennell, recently in Arizona; Morton Webber, of New York; Peter N. Nissen, who invented the stamp; Lionel Lindsay and Gelasio Caetani, from San Francisco. Messrs. Lindsay and Reece are graduates of the University of California. Most of these men are holding commissions in the engineering corps or in the field artillery, for both of which services their previous experience helped them. Mr. Caetani is with the engineers of the Italian army; the others are with the British forces in the field.

TOPICS OF THE WEEK.

RAND MINES, LTD., AND THE WAR.

Although [illegible] from the address delivered by Mr. Schumacher [illegible] similar occasion [illegible] the speech made by [illegible] from the Chair at the Rand Mines meeting [illegible] important phase [illegible] operations of the group [illegible]. The feature of Mr. Wallers' address was its [illegible] analysis of the effect [illegible] war upon the industry [illegible] the Rand Mines [illegible] Although, as Mr. Newman [illegible] pointed out at the Consolidated meetings the [illegible] have been carried [illegible] successfully but for [illegible] at its present was of [illegible] necessity to the [illegible] all its leaders have [illegible] unwearying efforts, [illegible] well of shareholders [illegible] and the country [illegible]. The results won [illegible] figures of the group during 1915, and in recent months, [illegible] reviewed in the speeches from the Chair at the various meetings held in the past few days. Of these the Crown Mines are doubtless the most interesting, and the reader is referred to the long and detailed speech of the Chairman, Mr. Samuel Evans, for a complete account of the position and prospects. Summing up in a few words, recent results from the other mines of the group, Mr. Wallers said: "The result since the beginning of the current year call for little additional comment. . . . The Nourse Mines continue to have a difficult time with poor development. The Geldenhuis Deep looks like having an even better year than last, while the Rose Deep and Village Deep results are normal. The Ferreira Deep is earning good profits, and at the same time meeting and overcoming troublesome times with the movements of strata that occur from time to time. The New Modderfontein B. and the City Deep mines are thoroughly well maintaining this year the very excellent results they achieved last year." Compared with those at the end of 1914, the ore reserves of this group at the end of 1915 showed a substantial increase, though not more than might have been expected in view of the increased labour supply. The latter, it would seem, was used chiefly to increase the tonnage milled, the result being an addition of £686,000 to the total amount of gold produced by the mines of the group. This feature of the year [illegible] some appreciatory remarks from Mr. C. Renaud, who is peculiarly well fitted, from his visit to Europe during the year, to appraise the value of this addition to the Allies gold supply. The most valuable part of Mr. Wallers' address, as we have already said, was that in which he examined the effect of the war upon the group. He showed, for instance, that the very large increase in the cost of stores and materials was due in a great measure to the disorganisation of the freight market and the fabulous rates now ruling in that connection. Careful estimates proved that the increase in working costs, due to higher cost of stores and materials, amounted to 9d. per ton, or in other words, on the tonnage milled by the mines of the group, a total additional cost of approximately £315,000 for 12 months. In addition to this, there was the necessity of having largely increased reserve supplies to meet emergencies which led to the gradual accumulation by the mines of stocks much in excess of those carried in normal times. The experience of the mines of this group may be regarded as typical of those of the industry as a whole. And the conclusion to be drawn, of course, is that the industry is playing its part manfully in the great world-struggle. While it is, on the one hand, constantly replenishing the gold supply and maintaining London as a free gold market, it bears, on the other hand, its share, indeed more than its share, of the increased cost of taxation, labour, freights and supplies. And, judging by the cheerful and uncomplaining tone of the Chairman's speech at the Rand Mines meeting, the spirit in which it is shouldering all its added burdens and fulfilling its self-imposed greater responsibilities to the Imperial credit, is in keeping with the best traditions of the industry and of the race.

ECONOMIC FREEDOM vs. STATE SOCIALISM.

The week has produced two notable pronouncements on the subject of the Far East Rand. Though both are commendably brief and businesslike, they combine to remove any doubt whatever regarding the views of the most progressive of our industrial leaders. Mr. E. A. Wallers, who doubles the part of President of the Chamber of Mines with Chairman of the Rand Mines, Limited, gave a very definite indication of his views at the annual meeting of the latter company. Doubtless, because his opinions, as expressed before the Select Committee on the Far East Rand, had been printed verbatim in the published evidence led before that body, and likewise because he may have occasion to refer to the matter at greater length at the quarterly meeting of the Chamber next Monday, his remarks were very concise, though none the less clear. He said: "A Bill to help towards the more effective and rapid development of untouched areas in the Far East Rand reached a certain stage before the House of Assembly, but most unfortunately was not proceeded with to the end. The continual delay in the further opening up of this section of the fields is bound to be a most serious matter for all the inhabitants of the Union." Later on, dealing with the economic outlook after the war, he declared: "With us here the problem (although presenting some points of difficulty) should certainly be capable of much easier solution, provided always that the people of this country, shedding all party political prejudices, definitely realize that the expansion of this industry in other undeveloped areas of these fields, coincident with the expansion and creation of allied and other industries, based upon our own raw materials is the essential factor in the solution of our problems—is, indeed, the only means open to us." Here we have stated, in the plainest of plain terms, the whole duty of the public-spirited citizen who wants to see the country advance. New industries must be started wherever possible, and the legitimate expansion of the existing ones must be fostered. This latter can only be achieved by the free play of individualistic enterprise encouraged, not restricted, by the Government—by, in fact, the exercise of the fullest measure of economic freedom as distinct from State interference or State competition. Even more explicit was the statement on the subject made by Sir Abe Bailey to his constituents at Krugersdorp the other night. Possibly, because some of his friends had lately been extolling the collective and communal, or Kaffir-kraal, benefits of State mining, the views of the member for Krugersdorp were anticipated with unusual interest. But no fear need have been entertained that the robust commonsense of the member for Krugersdorp would have succumbed to the easy-going Collectivism lately preached by amiable "Scientific Socialists." Sir Abe describes the proposals of these gentry in very downright and unequivocal terms; and nobody can accuse Sir Abe Bailey of any desire for "truckling to foreign capital" or otherwise being made a party to the "murders, stratagems and conspiracies" of which our opponents are wont to accuse us. For our sins, we have lately had to sit through the outpourings of the gentlemen who have constituted themselves the saviours of the Far East Rand, and it is refreshing, after listening to their incoherent tirades, torrential abuse and crude economics, to read the practical advice of Sir Abe Bailey. The people of South Africa can be trusted to distinguish between the sound and sincere advice of an experienced business man and the wild vapourings of ranting irresponsibles, who promise the advent of the Millenium.

THE STATUS OF THE ANALYTICAL CHEMIST.

In South Africa, as in Great Britain, the totally inadequate value attached to scientific training is only too clearly reflected in the attitude adopted towards it by the Government and public bodies. That the struggle for proper recognition is making headway in this country is shown in the annual report of the South African Association of Analytical Chemists, issued this week. Though it is admitted that, as in all the past years, dealings with the Government during the year have yielded almost negative results, it is hoped that in time to come the authorities will appreciate the efforts of the Association and look upon it as a body of professional men intent on the duties of their calling, willing and desirous to render assistance on all matters falling within their province. The report says: "The high professional standard required of those desirous of becoming associated with us has resulted in the formation of an Association of exceptional strength, and few chemists possessing qualifications of value now remain aloof." In consequence of the receipt of a memorandum on "the duties and responsibilities of Government analysts," the Council recently appointed a sub-committee to consider the question of the training, duties and remuneration of analysts in the employ of the Civil Service, and this Committee is at present collecting data on the subject and will report in due course. There is no doubt that the remuneration for the responsibilities of an analyst in the Public Service is entirely inadequate, especially in comparison with the remuneration given in other scientific branches of the Service, and it is hoped that by urging the Association's views in responsible quarters an improvement will be effected. It is obvious that not only the Government, but also the general public is ignorant of the importance of the analyst. That this is, however, not merely confined to South Africa is shown by a circular which was recently issued in connection with recruiting in Great Britain. The circular was entitled "Parliamentary Recruiting Committee; Special Canvassing Campaign; Supplementary Directions to Canvassers"; and stated, under the heading "Enlistments in Special Corps: Men of the Classes (a) and (b) will, if they pass the necessary trade tests, be finally approved of for their respective corps. Men specially enlisted (a) such as navvies, tunnellers and chemists; (b) skilled workmen, such as artisans, etc.; (c) St. John's Ambulance men, etc.; (d) pharmacists and other specialists for the R.A.M.C.; (e) men who are not eligible for infantry, but suitable for Departmental Corps, A.S.C., R.A.M.C., etc." In commenting on this circular, in the "Morning Post," Sir William Ramsay says: "It will be noticed that the classes are arranged according to rank, and that chemists are included in the lowest classes. It is charitable to suppose that this has been done in sheer ignorance; but is it not time that men of such gross incapacity as the framer of this leaflet should no longer have any voice in national affairs? This is no isolated instance. My experience has shown me, during many years, that Government officials, from the Ministers to the subordinates, are disgracefully ignorant, not merely of the nature of the work done by chemists, but also of their professional and social standing." We entirely agree that chemists in South Africa cannot fail to be in complete sympathy with these remarks from such a distinguished source. Such an instance proves beyond question the necessity for analysts and other chemists joining together in associations in order to educate those in high places to a proper appreciation of the value of the chemist. The report also refers to the question of instituting a certificate of competency for assayers, which was discussed at the last annual general meeting and referred to the Council, and which was considered early in the year. A deputation waited on Mr. R. N. Kotze, Government Mining Engineer, for the purpose of submitting the views of the Association on the matter. At the request of Mr. Kotze, the Association submitted a memorandum in support of its views, together with a copy of the Act in force in British Columbia, relating to the certification of assayers there, and the reasons leading to its adoption. In this, as in the other matters tackled by the Council, its patience and pertinacity will, it is to be hoped, prove successful.

THE HALF-YEAR'S TRANSVAAL GOLD DIVIDENDS.

THE following table show the dividends declared by Rand and outside gold mining companies to date for the half-year just completed [illegible] the total rate of dividends for the two preceding years.

Company.	Date.	No. of Dividend.	Rate %	Issued Capital £	Amount £	Total Rate 1915.	Total Rate 1914.
Brakpan Mines	June.	9	22½	750,000	168,750	40	30
City Deep	June.	8	22½	1,250,000	281,250	33¾	23¾
Consolidated Langlaagte	June.	6	12½	950,400	118,750	25	20
Consolidated Main Reef	June.	16	6¼	924,364	57,722	12½	11¼
Crown Mines	June.	30	25	940,106	235,000	65	85
Durban Roodepoort Deep	June.	13	2½	440,000	11,000	7	7½
East Rand Proprietary Mines	June.	22	2½	2,445,897	61,147	11¼	17½
Ferreira Deep	March.	26	22½	980,000	220,500	42½	75
Geldenhuis Deep	June.	33	12½	585,753	73,219	20	18¾
Geduld Proprietary	June.	4	5	970,000	48,500	10	5
Ginsberg	June.	26	7½	210,000	15,750	15	17½
Langlaagte Estate	June.	52	5	886,500	44,325	15	10
Luipaardsvlei Estate	March.	5	2½	472,012	11,800	3¼	
Meyer and Charlton	June.	53	15	200,009	90,004	80	70
Modder B.	June.	8	37½	700,000	262,500	67½	55
New Goch	June.	8	5	550,000	27,500	10	
New Kleinfontein	June.	23	5	1,451,540	57,577	10	10
New Modderfontein	June.	20	16¼	1,400,000	227,500	32½	20
New Primrose	June.	16	5	325,000	16,250	17½	10
New Unified	June.	16	10	250,000	25,000	20	20
Nourse Mines	June.	21	5	827,821	11,391	10	17½
Robinson	June.	18	4	2,750,000	110,000	14	28
Rose Deep	June.	30	15	700,000	105,000	32½	35
Van Ryn	June.	25	17½	500,000	87,500	10	15
Van Ryn Deep	June.	6	20	1,196,892	239,380	32½	25
Village Deep	June.	16	8¾	1,060,671	92,309	21½	21½
Witwatersrand	June.	24	25	469,625	117,406	50	50
Wit. Deep	June.	21	12½	550,000	68,750	28½	32½
Wolhuter	April.	17	7½	860,000	64,500	12½	12½
Transvaal G.M. Estates	March.	20	10	604,225	60,423	22½	35
Glynn's Lydenburg	Jan.	29	7½	170,000	12,750	20	20

INDUSTRY, EDUCATION, AND RESEARCH.

In a paper on this subject read before the Textile Institute recently, Dr. W. Garnett, formerly educational adviser to the London County Council, said he had divided scientific research as applied to industry into three stages (1) Inception.—The purely scientific investigation conducted in the research laboratory, frequently with no definite practical object beyond the desire on the part of the investigator to extend the boundaries of knowledge. (2) Adaptation and Standardisation. The practical adaptation of the discovery to a manufacturing process on a small scale; the testing of the results and the removal of the difficulties which occur in practice; the standardisation of processes and parts. (3) Commercialisation. The adaptation of apparatus and processes to manufacture on a commercial scale, where cost of production is a prime factor. "It is in the second stage essentially," he added, "that German Kultur has had pre-eminence. It is in this stage that neither scientific societies nor the Government can render much assistance without the co-operation of manufacturers; it is here mainly that that co-operation has been lacking. My principal word to the manufacturers of Great Britain is the need of confidence and combination for successful competition with Germany and America after the war. Individualism may serve very well in competition for home trade, where all are on an equal footing; but it cannot compete with organised collectivism in foreign markets."

TO MAKE ESTIMATES.

The engineer who has sufficient command of his work to be able to make estimates for his superiors in round numbers and thereby reach correct and rapid conclusions demonstrates the value of "preparedness" of a kind. It requires some experience and an exceedingly reliable sense of perspective to do this work well, but it is worth cultivating. To be able to give the "boss an outside figure for temporary use that will stand the so-called "acid test of time" is to be indeed a master of one's profession, says "Power." To do this kind of work, one needs to acquire an insatiable appetite for cost data and to learn to carry in one's head some of the basic figures of operation, first cost and fixed charges. A knowledge of the slide-rule is helpful, though not essential if a man is good at approximate calculations by mental arithmetic. Without seasoned judgment it is hazardous to offer figures of this kind, for there is always the probability that the "boss," having once received them, will use them as final in his later deals and dickers with the board of directors, outside manufacturers, competitors and other potentates. But often it is entirely possible for an engineer to prepare a rapid exaggerated cost estimate, making the items ample and large enough to be on the safe side and thus to at least indicate the possibilities of the particular problem in hand. Not all engineers have the taste for those rough and ready approximations, but the man who can handle such work with a sense of proportion and with accuracy sufficient to establish the main points in record time is indeed to be envied.

STANDARD NOMENCLATURE AND SPECIFICATIONS FOR TAR AND PITCH FOR ROAD PURPOSES.

The Engineering Standards Committee have issued their report (No. 76) on Standard Nomenclature of Tars, Pitches, Bitumens and Asphalts, and Standard Specifications for Tar and Pitch, for Road Purposes. The Sectional Committee on Road Material was appointed at a meeting of the Main Engineering Standards Committee, held on July 18, 1912, and a Sub-Committee to deal with bituminous materials was appointed by the Sectional Committee on June 12, 1913, and met for the first time in October, 1913. The drawing up of definitions for the so-called "bituminous materials" used in road making, on which much confusion now exists, has been felt to be an essential preliminary to the preparation of standard specifications, and the Committee have devoted considerable time and care to the consideration of the exact meanings to be given to the terms tar, pitch, bitumen, native bitumen, asphalt, and native or rock asphalt. It is hoped that the definitions now recommended will go far to prevent the misunderstandings which at present occur in specifying materials belonging to the bitumen and asphaltic group. The report points out that the materials now used by road engineers for binding together the stones and other mineral aggregate used to form road crusts and road surfaces may be conveniently divided into three groups. These are (1) The tars and pitches obtained by the destructive distillation of coal or similar substances. (2) The bitumens and asphalts which are found in nature, or are obtained artificially from asphaltic oils. (3) Chemical binders, including the Portland and natural cements which owe their cementing value as road binders to chemical action, and which are not dealt with in the present report. Hitherto the term "bituminous material" has been loosely applied to tar products as well as to bitumens and asphalts, but the Committee have from the first considered that it was desirable from the road engineers' point of view to maintain a sharp line of demarcation between the two groups. The views put forward in correspondence from America and by American engineers of standing and experience have been carefully considered, but the Committee still adhere strongly to the view that the description "bituminous" should be applied only to the second group.

TRANSVAAL CHAMBER OF MINES QUARTERLY REPORT.

Review of Industrial Questions That Have Arisen in the Period.

The report of the Executive Committee of the Transvaal Chamber of Mines has the following :—

NATIVES EMPLOYED IN LABOUR DISTRICTS OF TRANSVAAL.

The monthly report issued by the Department of Native Affairs shows that at the 30th April, 1916, 283,809 coloured persons were employed in labour districts of the Transvaal. Of this number, 225,598 were engaged on mines and on the various classes of works, i.e., chemical, metallurgical, brick-making and other works, as defined in Part I. of the Coloured Labourers' Health Regulations, 1906, and 58,211 were in other employ.

PAY OF WINDING ENGINE DRIVERS.

A draft agreement has been submitted to the South African Winding Engine Drivers' and Firemen's Association and the Winding Engine Drivers' Mutual Protection Society respectively, and the views of the Societies have been received thereon. As a result of the negotiations that have taken place, an amended draft has been prepared, and it is hoped that an agreement will shortly be arrived at satisfactory to employers and employed.

WAGES OF MINE EMPLOYEES.

An agreement has been arrived at between the Amalgamated Society of Engineers, the Amalgamated Society of Carpenters and Joiners, and the Boilermakers' Iron and Steel Shipbuilders' Society, extending the overtime clauses contained in the joint agreement for surface mechanics to mechanics employed underground. The agreement will come into force on July 1st.

MINERS' PHTHISIS ACT, 1916.

This Bill has passed both Houses of Parliament. The more important amendments of the previous law are : Certain increases in compensation in respect of men suffering from miners' phthisis; the compensation of men suffering from tuberculosis only; the provision that after August 1st, 1918, sufferers from miners' phthisis, in whatever stage, shall only be entitled to the same amount of compensation; the provision for the elimination of tuberculosis from the mines; the periodical medical examination of all employees, and the establishment of a Central Medical Bureau for the purpose; and the power to assist industrial undertakings financially for the purpose of obtaining employment for beneficiaries. The Bill embodies the recommendations of the Select Committee on the working of the Miners' Phthisis Acts, and many of those advocated by the Chamber in its evidence.

TRADING WITH THE ENEMY ACT.

This Act has now been assented to, and is generally on the lines of the English Acts. The Chamber made representations on the Bill with a view to indemnifying companies registered in South Africa for past and future acts under the English Trading with the Enemy Acts. The Chamber's representations have been embodied in the Bill.

SPECIAL WAR TAX (GOLD MINES) ACT, 1916.

This Act has received the assent of the Governor-General, and re enacts the Special War Levy of £500,000, the machinery for levying the tax being the same as when it was originally imposed.

PATENTS, DESIGNS, TRADE MARKS AND COPYRIGHT ACT, 1916.

This Act has been assented to, and comes into operation on such a date as the Governor-General may by proclamation in the "Gazette" fix. The Act consolidates the laws relating to the grant of Letters Patent for Inventions, and for the Registration of Patents, Designs, Trade Marks and Copyright. The Chamber submitted certain amendments of minor importance to the Bill, which were accepted; its recommendation for an official examination of applications for patents has not been embodied in the Act.

TRANSVAAL MINING LEASES BILL, 1916.

This Bill was recently introduced into the House of Assembly, embodying the report of the Select Committee on the subject of the East Rand Gold Bearing Areas. The President and the Legal Adviser gave evidence on behalf of the Chamber before the Select Committee, and many of the Chamber's recommendations are embodied in the Bill. Its main provisions are : (1) The repeal of section 56 of the existing Gold Law, and the establishment of a Board to which applications for a lease of any portion of this area may be made, the application to contain the applicant's financial proposals, the general scheme of working the area, and the share of profits which he is prepared to pay to the Government in respect of the lease. (2) The Governor-General is empowered to grant an application of this nature on the recommendation of the Board, any lease so entered into to be laid upon the table of both Houses of Parliament. (3) Any lease entered into without the approval of the Board not to be binding until approved by resolutions of both Houses of Parliament. (5) Provision is further made for the amendment of existing or future leases, but no such amendment becomes valid until so resolved by Parliament. (5) Rent is to be paid to the freehold owner as though the area leased were claims. (6) Power is taken to permit prospecting on open proclaimed land, and in the event of a discovery of gold, the discoverer to be entitled to peg an area of not less than 25 or more than 50 claims.

LOCAL AUTHORITIES RATING AMENDMENT ORDINANCE, 1916.

This Ordinance was assented to on March 10th, 1916. It enables local authorities, if they so wish, to raise the revenue they may require by a single tax, namely, a rate upon the site value of land only, up to a rate of 7d. in the £. The single tax is supplemented by a further rate upon improvements, but the rate upon improvements is only in respect of rateable property held under mining title, and is in addition to the rate on the site value of the land. The definition of rateable property is further enlarged so as to include the present and reversionary rights of owners to the surface of proclaimed land. The Chamber made representations to the Government, protesting against the rate upon improvements not being equally distributed among all ratepayers, and also with regard to the provision including in the definition of "rateable property" the freehold owner's present and reversionary rights to the surface of proclaimed land.

ENGINEERING SUPPLIES.

It has been decided to send on behalf of certain of the groups who are members of the Central Buying Committee, a representative to the United States and Canada, with the view of expediting shipments of any material ordered from those countries through local merchants. It is not intended that any direct purchases through the representative should be made, so long as the mines are able to obtain the stocks necessary for their requirements through local merchants.

LOCAL MANUFACTURE OF SHOES AND DIES.

The Executive Committee has adopted a scheme for the re-making of old shoes and dies on the mines. The scheme is of a temporary nature, and is under the control of the Witwatersrand Co-operative Smelting Works, Ltd.

WATER SUPPLY.

The Water Court, constituted under section 30 of the Irrigation and Conservation of Waters Act, 1912, having determined the normal flow of the Vaal River and other matters in terms of section 14 of the Rand Water Board Supplementary Water Supply (Private) Act, 1914, the Rand Water Board has decided to proceed with a modification of its original scheme for obtaining water from that river. The new scheme provides for five million gallons of water per diem, at a capital cost of £758,000, and it is expected that the supply will be available within a period of approximately three years.

VACANCIES ON THE EXECUTIVE COMMITTEE.

Mr. J. H. Crosby and Mr. Louis Marks having resigned their seats on the Executive Committee, the vacancies will, in terms of Article 41 of the Chamber's Constitution, be filled at the ordinary meeting to be held on June 26th. In accordance with that article, Mr. P. Ross Frames was appointed to fill the casual vacancy created by the resignation of Mr. J. H. Crosby until such ordinary meeting, and is eligible for re-election at the meeting. Nominations to fill the vacancy created by the resignation of Mr. Louis Marks will be received by the joint secretary and legal adviser before or at the meeting.

MEMBERSHIP.

The following withdrawals from membership as at 31st December, 1915, have been notified, namely :—Booysens Estate, Ltd. (in liquidation); representative, Mr. F. Leslie Brown. Robinson Deep (in liquidation); representatives, Messrs. A. C. Grant and Clement Davies. Associate member : Mr. Charles Aburrow, M.I.C.E., resigned. The following new members are notified : Robinson Deep Ltd.—Representatives, Messrs. D. Christopherson and F. Leslie Brown. Anglo-French Exploration Co., Ltd. Representative, Mr. W. Dalrymple. (This company was notified in the December report as withdrawing from membership as at 31st December, 1915. Resignation was withdrawn 28th December, 1915.)

REPRESENTATION.

The following changes in representation have taken place : Village Main Reef G.M. Co., Ltd. : Mr. F. H. Barry vice Mr. R. Raine. Witwatersrand G.M. Co., Ltd. : Mr. G. H. Beatty, second representative. Geduld Proprietary Mines, Ltd. : Mr. B. Madew vice Mr. W. McC. Cameron. City Deep, Ltd. : Mr. C. Meintjes vice Mr. R. W. Schumacher. Modderfontein B. Gold Mines, Ltd. : Mr. A. Mackie Niven vice Mr. H. Stuart Martin. Village Deep, Ltd. : Mr. H. Stuart Martin vice Mr. S. M. Nelson. Ferreira Deep, Ltd. : Mr. C. Distel vice Mr. C. Meintjes. Robinson G.M. Co., Ltd. : Mr. S. M. Nelson vice Mr. C. Distel.

THE S.A. INSTITUTION OF ENGINEERS.

Outgoing President's Valedictory Address—Text of Remarks by Mr. W. Ingham.

The valedictory address delivered by Mr. W. Ingham, the outgoing President of the South African Institution of Engineers, last Saturday night, has the following *inter alia*:

It is one of the privileges of the outgoing President to present a short review of the year's work of the Institution, and to make a few comments on current topics. I will, therefore, discuss briefly the position of the Institution as it appears to me, and I regret to say that it is not in a flourishing condition at present. I admit that the times are abnormal, and no doubt the war has had a considerable influence on the present state of affairs, but apart from that, there is a lack of interest taken in the Institution, and this is to a great extent due, primarily, to the members themselves. I therefore appeal to the members of the Institution to take a greater interest in its work in future, and more particularly in the provision and discussion of papers. I am aware that a large number of members are of opinion that it is not in their interests to put forward their views, as they are afraid it might adversely influence them with their chiefs. If there is any reason for arriving at such a conclusion, then the sooner the matter is dealt with the better it will be for the Institution generally. I must, however, say, and I say it with all sincerity, that no self-respecting consulting engineer would lower himself to such a level as to allow such matters to influence him in his daily relations with his men. It must not, however, be overlooked, that it is the duty of a junior official to consult his chief if he desires to read a paper on any subject affecting his department. At the same time, a chief should not interfere with those members who wish to take part in a discussion, so long as the views are not detrimental to the interests of those who employ him. My advice to the members in connection with this matter may be summed up in a few words—mutual trust and freedom of speech. I do not wish to trench on the path of my successor in office, but the experience of the past year proves that the Institution requires developing on the social side more than any other, and one method of obtaining this is by arranging regular monthly visits to works. It is also suggested that short papers of from 2,000 to 5,000 words should be invited from members dealing with any class of work which they have specially studied, and I have much pleasure in offering a prize of £5 for the best short paper read during the ensuing session.

Government Members and Industrial Commission.

On July 7th, 1915, Mr. Whittome proposed the following resolution: "That the South African Institution of Engineers offers its services to the Government of the Union of South Africa (and therefore to the Administration of Great Britain) for investigating any proposals of a technical nature brought forward in South Africa which purport to assist the arms of the British Empire." And if the foregoing is carried: "(1) The Council of the Institution to be instructed to issue through the Press an appeal to technical men to submit any proposals or ideas having for their object the advancement of the British cause. (2) The Council of the Institution be instructed to form Committees to consider proposals submitted and, when deemed advisable, to forward the suggestions to the Union and British Governments." After discussing the resolution it was resolved to recommend to the Council that a deputation from the Institution interview General Smuts to discuss the lines on which investigations should be conducted, with a view to the possibility of utilising our resources in this time of emergency, and further to suggest that the investigations be continued and extended to cover the question of the establishment of permanent industries in the Union of South Africa. In connection with this matter a deputation comprising Messrs. Bernard Price, E. G. Izod, and J. A. Vaughan, interviewed General Smuts, the Minister of Defence, at Pretoria on the 18th July, and the deputation explained that it wished to offer the services of the Institution to the Union Government, and that it [illegible] to the Imperial Government, in connection with engineering matters which might assist in the successful prosecution of the war in Europe. The results of the interview were summarised by the deputation as follows:—It is for the Government to consider the Institution's services, and to refer to it [illegible] on any engineering matters which may be referred to it. (2) The Government will communicate with the High Commissioner asking him to get into touch with Mr. Gillette, on the question of the subject matter in this country by articles of which the Imperial Government may be in need. (3) The Government will communicate with the Institution when any further developments take place in connection with the manufacture of munitions of war. Shortly afterwards the Minister of Defence requested Sir W. Hoy, General Manager of the South African Railways, to form a Commission, which was subsequently known as the "Government Munitions and Industrial Commission," to investigate and report on the best method of developing the resources of South Africa, so as to release [illegible] such as labour, material (including foodstuffs), and transport for the use of the Allies during the war—such work to be carried out as far as practicable with a view to making it permanent. It is gratifying to know that this matter was taken up by the Government principally at the instigation of our Institution. Sir W. Hoy immediately got into touch with the leading societies, institutions, Chambers of Commerce, etc., throughout South Africa, and called a meeting of delegates to consider the matter in Johannesburg. About 70 representatives were present from various centres in South Africa, and they decided to nominate a Central Committee composed of about 24 members. This Central Committee then elected an Executive composed of 7 members resident on the Rand, with Sir W. Hoy as Chairman and Mr. E. Chappell as Vice-Chairman, and included no less than three members of the Institution, viz., Messrs. Vaughan and Lavenstein and myself. After a large amount of information had been collected it was decided to present an interim report dealing principally with the best means of relieving home industries. This report was presented on the 27th March, and was favourably received by the South African Press. The work of the Commission is still proceeding, and now awaits a further reference from the Government in regard to South African Industries.

Centralisation of Offices, Etc.

In July last Mr. Cassel suggested that the Council should consider the question of the centralisation of offices and secretariat of the various technical societies on the Rand, and that the following societies should be approached in the first instance: The Chemical, Metallurgical and Mining Society of South Africa, the Institution of Electrical Engineers, The Association of Mine Managers. The two former societies accepted the invitation, and several meetings have been held, but we are not in a position to progress at present.

Uniformity in Weights and Measures, Etc.

The time has arrived when South Africa should seriously consider whether it is not opportune for introducing the metric system of weights and measures and decimal coinage. After the war our business relations with Russia and France will, I trust, be much wider than in the past, and with this in view, to say nothing of the saving in money and labour, it is desirable that a common system of weights and measures and coinage should be adopted in all civilised countries. I am quite aware that there are two sides to this question, but after studying the subject for over twenty years I have come to the conclusion that there is much more to say in favour of the system than against it. I

therefore hope that the Institution will, at an early date, appoint a Sub-Committee to go thoroughly into the question and report at the earliest possible date.

Inventions and Munitions Sub Committee.

The Inventions and Munitions Sub-Committee have investigated a large number of proposals, but unfortunately the inventors have not shown sufficient novelty to warrant the Institution in recommending them to the Government for further investigation.

"The Status of The Engineer."

A Sub-Committee was appointed last Session to consider "The Status of the Engineer," and information is being collected from various sources and will be reported upon in due course. I expressed the opinion in my presidential address that something should be done in regard to security of tenure, fees, and the relative position of the engineer and his employer in private practice, and I am still of that opinion.

Student Members.

In October, 1915, a Sub-Committee appointed to consider the best way of helping student members, recommended that the three principal technical societies, namely, the South African Institution of Engineers, the Chemical Metallurgical and Mining Society of South Africa, and the South African Institute of Electrical Engineers, should combine in an effort to make one students' society common to all three institutions. The students to control their own business under the supervision of the societies mentioned. It was, however, finally decided to leave the matter over until the end of the war.

The University Question.

In February last a meeting of the principal scientific and technical societies of the Witwatersrand was held in the School of Mines to protest against the Bill then before Parliament dealing with the University question, and the following resolution was unanimously carried and forwarded to the Prime Minister:—"That this meeting of members of the Councils of various scientific and technical societies of the Witwatersrand is strongly of opinion that the present is a most inopportune time for legislating on such contentious measures as the three University Bills now before Parliament." The following societies were represented:—South African Institution of Engineers, Chemical, Metallurgical and Mining Society of South Africa, Geological Society of South Africa, Association of Mine Managers (Transvaal), Witwatersrand Branch British Medical Association, Transvaal Institute of Architects, Association of Transvaal Architects, South African Branch Society of Architects (London), Transvaal Institute of Land Surveyors, Transvaal Pharmaceutical Society.

The Rand Goldfields.

The Mines of the Rand are now producing gold at the rate of about £40,000,000 per annum, and it has been of immense value to Great Britain and her Colonies in these times of great financial stress. It is also very satisfactory to know that there are still considerable areas of gold-bearing formations lying dormant on the East Rand, and it is hoped that development work will soon be commenced in that neighbourhood. The Engineers and Miners are doing good work on the Rand, and however much we may regret our absence from the fighting line, it should not be overlooked that we are at least serving some useful purpose in sending large quantities of gold to the Old Country. Since the war began a large number of men on our engineering staffs have gone to the front, and this has resulted in many of our leading engineers carrying out work which is usually left to subordinates. It has therefore been impossible, in many cases, to give that attention to the affairs of the Institution which would have been rendered in times of peace.

Irrigation and Conservation of Water.

This subject was dealt with in my inaugural address, and the necessity for proceeding with irrigation and conservation schemes has been brought home with great force quite recently in Cape Province. The excessive drought in the Karroo area on the one hand, and the floods in the Gamtoos Valley on the other, have shown that our rivers must be utilised and controlled to a greater extent than formerly if the country is to progress on rational lines, and the farming community protected as they ought to be. The backbone of this country is agriculture, and to be successful the cry must be, "Irrigation! Irrigation! Irrigation!" and, concurrent with that, a sound policy of conservation of water in our rivers.

Afforestation.

The depletion of our forests is another matter which should receive greater consideration from the Government, and a law should be introduced for enforcing the planting of trees on a large scale, so as to prevent denudation, and at the same time improve climatic conditions and flood control of our intermittent streams and rivers. For every tree cut down the Government should insist upon three being planted, and in this way a considerable improvement would soon take place.

Minister of Commerce and Industries.

It is hardly necessary to point out at this stage in the history of South Africa the absolute necessity of placing our business relations with other countries on a much firmer footing than formerly, and with this in view it is suggested that steps should be taken to insist on the Government appointing a Minister of Commerce and Industries. It is deplorable that British interests are not better looked after in the world's markets, and in this respect there is room for great improvement in our Consular service. As an engineer who has had considerable experience in the ordering of plant and material, I cannot overlook the fact that orders are much more sought after by foreign representatives of commerce than by our own representatives. We require "waking up" to our own interests, and this can only be done by having our business interests controlled by a specially appointed Minister of Commerce and Industry, with a seat in the Cabinet. The British nation was getting lethargic before the war, and Bernardi, with all his faults, was not very far wrong when he stated that war improved a nation in many ways. There is no doubt in my own mind that although a large number of our best men have been killed during the progress of the war, the British Empire will come out of it in a more wide-awake condition than before the war, and it is our duty to see that the fruits of victory are not taken away from us after this murderous and unnecessary war is at an end.

Industrial Development.

It is hardly necessary to mention this matter at the present time, but it is a subject which will have to be dealt with seriously in the near future if we desire South Africa to take her place as a producing nation. The importance of foodstuffs, such as flour, jam, eggs, bacon, butter, meat, etc., and the exportation of raw material and the re-importation of the finished article shows a want of business acumen on the part of the inhabitants of this glorious country. Efforts are now being made to alter the errors of the past, but South Africa moves very slowly as a rule, and it is only by constantly pegging away at the subject that we can hope to obtain success.

Conclusion.

Although I am retiring from the Presidential chair, it is my intention to work in the interests of this Institution in every possible way, and I sincerely trust that the Council and members will do all in their power to further the good work which has been done in the past, and help the President elect in every way during the coming session. In conclusion, I desire to thank the Council and members of the Institution for their great kindness to me during the past year.

THE VALUATION OF METAL MINES.

By F. A. RICKARD.

The valuation of a mine for purchase and its assessment for taxation constitute two different problems. The tax-gatherer's valuation is made annually, and can be revised annually, therefore it is convenient to base it upon the actual profit—not production—of the previous year. The future does not concern the tax-gatherer, he takes short views of life; it is his duty annually to collect a contribution to the revenue of the State in equitable proportion. We shall leave him to his troubles, which are relatively small, for it is our purpose to discuss the valuation of mines for sale or purchase, which is a far more difficult problem.

VALUATION FOR SALE OR PURCHASE.

In order to value a mine, that is, to determine the price at which it is a reasonable purchase, it is necessary to estimate its future profits. That is done in successive steps, ascertaining (1) The average yield per ton of ore; (2) the average cost per ton of ore (the difference between (1) and (2) is the "profit"); (3) the tonnage available now; (4) the tonnage likely to be available in future years. Each step demands skill and experience. The yield is determined by a careful sampling of the ore exposed in the workings, by comparison with past records, and by an estimation of the probable extraction in the mill or smelter. The metal contents as determined by assay do not represent the yield; to ascertain that it is necessary to know the percentage of extraction by the metallurgical method most suitable. Mines are bought sometimes on the expectation of applying increased skill cords, with corrections based upon any anticipated to the extraction of the metals from the ore. The expectation may prove too flattering. The average cost can be ascertained from past recharge of conditions. The anticipations may prove fallacious. The records may be deceptive. "Cost" is interpreted variously. Among British-owned mines, particularly in Rhodesia and West Africa it is customary to give a figure for "cost" that omits many inevitable items of expense, such as head office expenses, taxes, insurance, depreciation, improvements, recruiting for labour, even development and prospecting. In some cases the omissions represent discrepancies of 30 per cent. to 40 per cent. from the actual cost, giving phantom profits highly useful for sharemarket purposes. The big mines of the Rand issue monthly figures of profits that are illusory because in the cost the Transvaal profits tax is omitted, together with London expenses, income tax, debenture interest, and additional expenditure on new equipment. The result is that the profits periodically announced are 30 per cent. more than the dividends. I have always argued that the profit to the shareholders, who are the owners of a mine as conducted on the joint-stock principle, is represented by the dividends that actually get into their pockets or are lodged to their bank accounts. To many persons some of the items, such as interest and taxes, seem beside the mark. The borrowing of money on debentures, however, usually represents a miscalculation in the original estimate of initial expenditure for development and equipment. As for income tax, it may be said that it is only a matter of bookkeeping since the collection at the source obviates later payment by the shareholder. But the income tax on a mine is a true (and most inequitable) item of cost, for in most cases it is a tax not on income but on the return of capital. Until a mine has redeemed its purchase price, its dividends are not income. A mine is a wasting asset.

"OVERHEAD" EXPENSES.

Many blunders in valuation are made by engineers owing to lack of knowledge concerning the "overhead" expenses. Any sagacious appraiser of a mine that is to be placed on the London market, and to be managed from there, should add 10 to 20 per cent., according to tonnage of production, to his operating or local cost, if he expects to make a forecast that will stand the test of future accomplishment. Indeed, the best school for the appraiser is last year's almanac; let him read the old reports and valuations of mines now approaching exhaustion. He will see how errors were made and how estimates were falsified. For example, the small additions to equipment made from year to year may seem a minor item. No allowance usually is made for rebuilding or replacing the existing reduction works, yet no mill or smelter remains intact for many years, if the owners are progressive. Fires and other accidents will happen. Decay and destruction, wear and tear, are inseparable from machinery and equipment. For example, the cost of new equipment at the Bunker Hill and Sullivan mine, in Idaho, averaged 80 cents per ton during 22 years, on a total operating cost of $2·66 per ton. Again, when I examined the Camp Bird mine in 1900 I found that Thomas F. Walsh, the owner, had extracted $2,535,000 worth of ore at a cost of $6·50 per ton. I estimated the ore assured at $6,000,000, and anticipated that the cost could be reduced to $5·25, in consequence of an improved equipment and larger tonnage of production. The mine more than fulfilled the expectations of productivity and profit, but the average cost was $10 per ton. The administration and general expenses of a London company proved more costly than I had anticipated, in comparison with the thrifty management of an individual owner. The reading of old reports shows that a post-mortem will give data more reliable than those obtainable from a diagnosis made while the patient is alive; unfortunately, old reports disappear, to the comfort of the profession, and exhausted mines cease to be interesting except to the historian; therefore this source of guidance is not readily available to the student of the subject under discussion.

*Abstract from a paper read at meeting of International Engineering Congress at San Francisco.

TONNAGE.

The ore exposed can be measured and an estimate of that which is partly exposed can be made with reasonable accuracy by an experienced engineer, that is, by one wise to the vagaries of various types of ore deposit. When, however, the next step is taken, namely, the estimation of ore likely to be rendered available in future years, as the result of intelligent development and exploration, the engineer faces a crucial problem and one that may render all his previous calculations utterly futile. The test of science is prediction; the inability of the mining engineer to predict the continuity of an ore body suggests that the appraisal of mines is not a science, but an approximation based upon empiricism. Attempts have been made to express the probabilities of ore persistence by formulæ. Some engineers allow for future prospects by adding a fixed proportion from 20 to 25 per cent., for example to the ore already proved. Such short cuts are illogical. They constitute a mere surmise. Mr. H. C. Hoover has suggested that "the minimum extension of an ore body or ore shoot in depth below any horizon would be a distance represented by a radius equal to one-half its length." This may apply to his special experience in Western Australia, but it is dangerous doctrine, for, as he himself adds: "This is not proposed as a formula giving the total amount of extension in depth, but as a sort of yardstick which has experience behind it." Another writer, with less experience and therefore greater positiveness, has offered sundry elaborate formulæ for the purpose of expressing the probabilities of ore extension in depth. These, apart from their academic interest, are interesting as indicating how many uncertain factors are involved in the calculation. They are useful as suggesting a line of reasoning, based upon the length and thickness of the ore shoot, the number of levels already proved, and the patchiness of the lode within the ore shoot. Indeed the methods of an actuary may be illuminating to an engineer, but the latter must realise that human life has been studied much longer than the distribution of ore underground, and that the eccentricities of human nature are better understood than the vagaries of ore deposition. Calculations based on a large number of guesses can only yield a guess. The doctrine of probabilities has been stultified in mining too often to allow of its being stated as a scientific thesis. Having ascertained the tonnage of ore in the mine and the probable profit per ton, the engineer can say that the ore assured will yield so much money, while the ore likely to be uncovered will enable so much more money to be taken out of the mine in future years. How much then is the property worth? While the estimation of ore in most mines is hazardous, especially in the case of rich precious-metal veins or 'coles, it is a pleasant fact that in certain types of deposit the size and continuity of the ore bodies are such as to minimise the variation of metal contents to the point of relative uniformity of production over long periods. This is true, or has been true for many years consecutively, of the native copper lodes of Michigan, the gold banket of the Witwatersrand, the gold-bearing schist of the Homestake, the copper-pyrite lenses of Huelva, and the extensive chalcocite impregnations of Nevada, Utah and Arizona. However, even in these cases, it must be confessed that, for purposes of appraisal, the knowledge now available has come at a late date; it has come in the wake of experience, not as the result of preliminary investigation. Moreover, it is not applicable to other mines in other regions, save at great risk. Most young mines —and it is young mines we must appraise, as it is young people that we must insure—cannot be judged on the basis of experience on the Rand or in Michigan. That is why engineers with local experience in particular districts so often fail in diagnosing mines in other districts. We return to the question: what is a mine worth, given an estimate of future profits? We have seen Mr. Finlay's formula, based on 5 per cent. for interest and 5 per cent. for amortization. I have said that

his return of 5 per cent. might do in the case of the copper and iron mines of Michigan, but it was too low for most mining enterprises. Mr Hoover says that "the mining business is one where 7 per cent. above provision of capital return is an absolute minimum demanded by the risks inherent in mines, even where the profit in sight gives warranty of the return of capital." With this, of course, I agree. Indeed, in most precious metal mines 10 per cent. is not too much. On the other hand no figure can be stated as generally applicable. It depends upon the factor of risk, which varies in each case, not only as regards the continuity of the ore, but the capacity and honesty of the management. This feature of the problem has been well elucidated by Mr. Burnham, who asks, and answers, the question as to how much a mine ought to pay over the standard rate of interest on gilt-edged stock. Besides the addition to cover "the yearly contribution for capital redemption," he insists that provision be made for "the risk of loss of either capital or interest." Thus by the time the engineer has made his estimate of the value of ore assured and the profit therefrom, he finds his figures blown into the air by this explosion from under his very feet. These final considerations regarding the rate of return on the purchase price of the mine afford divergencies so big that all the little refinements of measuring, sampling and assaying are rendered pitifully inconsequent. If we take the standard rate of interest on national bonds as 3 per cent., and if we add to this another 4 per cent. for capital redemption, we are brought face to face with the decision as to what further percentage must be made to provide for the risk inherent in mining and the final risk involved in a particular mine. Suppose we agree on the third item of our enquiry and call it 3 per cent., even then we have the fourth item to ascertain—and it is by far the most momentous in the whole of our enquiry. It may range from 0 to 100 per cent. Let me illustrate. Many years ago I examined a small mine in Boulder County, Colorado. The vein was narrow but rich. The ore-bearing ground was sampled thoroughly. The result was to show that $150,000 worth of ore could be extracted at a cost of $40,000, working through an existing adit, so that $110,000 could be earned. The owners were willing to sell for that sum, half cash and half in six months. The winzes below the bottom level or adit showed that the vein was poor and broken by faults. The prospects in depth seemed to me slim. I considered it a poor purchase, because the risk of the known ore yielding less than the amount estimated outweighed the probability of finding more ore in virgin ground. Even 100 per cent. per annum—that is, the return of the purchase price in one year, as was feasible in this case—was not good enough. The later story of the mine justified this decision. In a recognised guide to these matters, namely, the "Report Book for Mining Engineers," by A. G. Charleton, an example of mine valuation is given. In this hypothetical case the property contains 705,000 tons of ore averaging $12 in gold per ton, making $8,448,000. Allowing for a recovery of $10 and a cost of $7.50 per ton, the profit comes to $2,464,000. The conditions specified are—(1) That the above profit is to be won over a period of 11 years; (2) the plant and equipment are to cost $183,700, and to this is to be added compound interest for two years at 5 per cent. during the time of development precedent to profitable production; (3) the capital is to be redeemed at 2½ per cent.; and (4) the purchaser is to be allowed 20 per cent. on his money. Therefore the present value is $220,000. As if this were not drastic enough, Mr. Charleton shows that on a 40 per cent. return the present value would be $4700. This "reductio ad absurdum" shows where these methods of valuation land. After taking great pains to sample the ore and equal trouble to ascertain the profitable metallurgical recovery, after having inquired thoroughly into the question of cost, and made several solemn guesses at the persistence of the ore—having solved these preliminary problems, the engineer is to choose between 5, 10, 20, or even 40 per cent. as the rate of return required to justify the "investment." The elaboration of any calculation should be proportioned to the possible accuracy of the factors involved. Otherwise it fares no better than the New Jersey farmer's method of weighing sheep. The animal is attached to one end of a fence rail while a bag of stones it attached to the other end. First the exact centre of the unloaded rail is ascertained, then the sheep and the bag of stones are fastened at an exactly equal distance from the centre, or fulcrum, and a perfect balance is obtained. When all this has been done with painstaking care, the bag is emptied on a clear bit of ground and the weight of the stones is guessed. Why not guess at the weight of the sheep in the first instance.

MINES ARE NOT TO BE APPRAISED ON THE BASIS OF AN INVESTMENT.

Obviously, therefore, mines are not to be appraised on the basis of an investment. Whether iron or coal mines are so different from those yielding the precious metals, or copper, lead, and zinc, as to warrant a different treatment, I leave it for others to state. My own experience has been chiefly in gold and silver mining. In the case of gold, one factor, namely, the market price of the metal, is eliminated. Just now the price of the base metals is subject to abnormal fluctuations, but even in peaceful times this element of uncertainty is an essential part of the business. Some of the bigger copper mines have reserves so large and operations so systematic that the perturbing factors are apt to be forgotten. Promoters and brokers speak of such steady producers as "manufacturing propositions," meaning that they are on an enduring basis. This, of course, is balderdash. A mine is a wasting asset. It has no goodwill; that exists in the management and is transferable to another mine, but it does not ensure the life of a particular property. The resources of a mine are not renewed; at some stage in its history they are under-estimated and conjectural, but that does not mean that they are increased; they are merely uncovered. The art of mining cannot be applied on scientific principles until two basic ideas are fully comprehended—(1) A mine is a wasting asset; (2) mining is a speculative business. To treat a mine as an investment, and to appraise it on that basis, is to ignore the cumulative facts of to-day and of other days. Mining is a speculation that can be made wise or foolish according as a man recognises the inherent risk and takes his chances accordingly. As a speculation it is highly profitable when conducted intelligently. The ascertainable factors are sufficiently numerous to place a premium on trained observation and the inferences therefrom are sufficiently valuable to give an advantage to men of intelligent experience. The unknown and unknowable elements in the problem will remain so numerous and so important as to involve a risk so large, and the chance of a mining so big as to stimulate the adventurous spirit of man.

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ECONOMIC GEOLOGY AND MINERAL INDUSTRY OF SOUTH-WEST AFRICA.—VIII.

By Dr. P. A. Wagner.

MARBLE.

In the western and north-western portions of Damaraland and in the Namib Desert, to the east of Swakopmund and to the south-east of Walvis Bay, there is, as previously pointed out, an enormous development of marble—that is, crystalline limestone capable of receiving a polish. The rock gives rise to quite a number of important ranges and eminences, including: The Hamilton Mountains, east-south-east of Walvis Bay; the Kongochab Mountains, which run parallel to the foregoing some ten miles to the west; the Sphinx Range, to the north-east of Sphinx; the White Mountain at Etusis, to the east of Ababis; the Otjipipopa and Andreas Mountains, situated respectively to the west and east of Habis, on the old Government railway from Swakopmund to Karibib; the Okaschampus Mountains on the farm Navachab, to the south-east of Karibib; the Dernburg Range, to the north-west of Karibib, which extends from Usakos to Okawayo; the Onguati Range, to the north of Onguati, to which reference has already been made; the Tjirunda or Kambeneno Range, to the north-west of Omaruru, which appears to form a continuation of the marble belt, traced by Clous (102), from the neighbourhood of Neneis, on the Omaruru River, to Kuwab, situated about twelve miles east-south-east of Okombahe; a range to the north-east of Okombahe; the Epako Range, which parallels the Otavi railway on the west at Epako. Marbles of almost every conceivable hue, texture and pattern—veined, banded, variegated and mottled—are represented, and, while it appears very doubtful whether any of the material is sufficiently pure or homogeneous to compete with the white Carrara rock for statuary work, and much of it is quite worthless owing to the presence of tremolite and other silicates, there can be no question that enormous supplies of high-grade marble, well suited for interior decoration and architectural purposes, are available, which should, when once the transport problem has been solved, furnish the basis of a sound and lasting industry. White marble builds the White Mountain at Etusis, the Hedwig Hügel to the west of Habis, and the Okaschampus Range, on the farm Navachab, which is twelve miles in length and rises to a height of almost 1,300 feet above the surrounding country. The rock of the Hedwig Hügel is of pure ivory-white colour, but is disfigured by yellow spots, and therefore not suitable for statuary work. The white marble of the Onguati, Tjirundu and Epako Ranges is too coarsely crystalline to be of any value, and the rock of the Kubas and Sphinx Ranges is so flaky or splintery that it is not worth quarrying. Coloured and "fancy" marble is very extensively developed in the Dernburg Range to the west and north-east of Karibib, on the farm Navachab, in the Otjipipopa and Andreas Mountains at Habis, and in the Namib to the east of Swakopmund. The most important deposits are in the Dernburg Range to the east of Karibib, where red white-veined, yellowish-pink, blue (Cipolin), blue banded, and white black-veined varieties of marble are found. In the Mathildenberg, which forms part of the continuation of the Dernburg Range to the north-east of Karibib, there occurs in addition to the above-mentioned varieties, marble of pale-blue colour, closely resembling Italian *Bardiglio*. To the east of the Okaschampus Mountains, on the farm Navachab, there is a small eminence, known as the Horrideh Berg, which is built up entirely of handsome green serpentine marble, not unlike Grecian *ver antigui* in appearance. In the marble occurrences in the Namib, to the east of Swakopmund, the prevailing tints are shades of yellowish-green, but there is also a fairly considerable development of a handsome red-veined variety of the rock.

Exploitation of the Marble Deposits. The vast extent of the deposits and the strikingly handsome appearance of much of the marble early attracted notice, and at the beginning of 1909 the Hamburg-Afrika Marmor-Gesellschaft was floated, with a capital of 3,000,000 marks, to acquire from H. C. F. Schmidt and R. Capua the rights over the Dernburg Range, Navachab, Habis, Etusis and Swakopmund deposits. Several large quarries were opened up by the company, the most important being in the Dernburg Range. The quarries were equipped with the latest appliances, wire-saws, etc., and connected by lines of narrow-gauge railway with Karibib; while at Swakopmund large cranes and transporters, capable of handling blocks up to 20 tons in weight, were erected on the new jetty. No difficulty was experienced in quarrying blocks of the largest size and in conveying these to the coast by rail, and during 1913 marble to the value of over £1,450 was actually exported to Germany. The cost of getting the rock to Europe, however, proved prohibitive, and some time before the outbreak of the war all work at the quarries was suspended. The charges in connection with the transport of the marble were made up of (*a*) the cost of conveying the rock to Swakopmund on the narrow-gauge Otavi railway; (*b*) the cost of shipping the large blocks in the open roadstead at Swakopmund—quite an important item; and (*c*) the freight charges, which were very heavy, as skippers of ordinary cargo boats were naturally somewhat chary of taking the huge masses of rock on board without having any special arrangements for keeping them in place in rough weather. With regard to the first two items, conditions have been greatly improved through the completion of the broad-gauge railway from Karibib to Walvis Bay, one of the best natural harbours on the African coast. In regard to the third it is difficult to see how costs could be reduced unless a small steamer specially designed for carrying the marble blocks were built.

*From Geological Survey Memoir.

MICA.

Muscovite in plates and books up to [illegible] inches in diameter, occurs in [illegible] lenticular bodies of pegmatite and pegmatite quartz to the north-east and south-east of Khan Khanas in Great Namaqualand. A fair amount of exploratory work was done on the deposits, but the mica proved to be too badly flawed to be of any commercial value.

MOLYBDENITE.

The writer has seen fine specimens of molybdenite from a pegmatite vein to the south of Usakos, and also from a deposit said to exist in the Kuiseb Valley near Walvis Bay, but has not been able to glean any definite information in regard to either of these occurrences. Range (71) mentions the occurrence of molybdenite in granite at Aus and also in the Velloor Hills on the Warmbad District.

SALT.

Notwithstanding its arid climate South-West Africa is very poorly off in the matter of salt pans as compared with the Cape Province. The only salt pan of note in the southern portion of the country is that at Aminuis, in the Gobabis District, which yields fairly considerable quantities of salt of good quality. In the northern portion of the country there are, as already stated, several important salt pans to the west of the Etosha Pan. A pan is also said to exist in the neighbourhood of Okanjande in Northern Damaraland. The pans along the coast are of no importance economically, owing to the fact that their salt always contains a considerable proportion of wind-blown sand.

SULPHUR.

To the deposits of sulphur, or, more correctly speaking, of sand cemented by sulphur, occurring on Pelican Point and elsewhere in the neighbourhood of Walvis Bay and also at Conception Bay, incidental reference has already been made. They do not appear to have any commercial value.

TANTALITE.

Tantalite in crystals and crystalline masses, up to three-quarters of an inch in diameter, is found in pegmatite at Donkerhoek, situated about 33 miles east-south-east of Lackalswater in the Karibib District. The occurrence is only of scientific interest.

TIN.

All the deposits of cassiterite hitherto located in South-West Africa occur in a belt of country, about 38 miles in width, extending in a north-westerly direction from Otjimbuwe, on the Khan River to the north-east of Karibib, to Uis, situated to the east of the Brandberg, some 14 miles south of the Ugab River. The southern portion of this tract is occupied in great part by the Erongo Mountains, and it is on this account sometimes referred to as the Erongo tinfield. The first finds were made in 1910 at Ameib, situated below the southern escarpment of the Erongo Range, and prospecting operations, which were greatly facilitated by the sparse character of the vegetation in the area under description, soon led to the discovery of the Daweb, Aubonhouis, Tsumtsaub, Neneis, Uis, Kawab, Otjumue and Kohero East deposits. At all these localities the cassiterite is found in veins and lenticular bodies of pegmatite, intrusive in the rocks of the Schist Formation and related genetically with the older granites of the Erongo area. The mineral also occurs in veins of aplite and pegmatic quartz, but, as far as the writer is aware, none of these have as yet been worked. The pegmatite, usually a coarse-grained rock of greyish-white colour, consists essentially of quartz, felspar—orthoclase, microcline and acid plagioclase—and pale greenish-white muscovite. The accessory constituents, apart from the cassiterite, include tourmaline, garnet (almandine), magnetite and apatite, in

addition to which the following minerals have been recognised: Beryl (Ameib), wolframite, monazite, columbite and molybdenite (Dawib), and lepidolite (Kohero East). Tourmaline and cassiterite appear mutually to exclude one another, inasmuch as pegmatite rich in the former mineral hardly ever carry cassiterite and *vice versa*. Cloos (102), who investigated this phenomenon, found that in the case of the tin-bearing pegmatites the cassiterite is generally replaced by tourmaline as the parent granite is approached. He concludes, therefore, that tourmaline was formed in the vicinity of the granite and cassiterite at some distance from it, and thus presumably at a somewhat lower temperature. The cassiterite is sporadically scattered through the pegmatite in large grains and crystalline masses. Some of the latter attain extraordinary dimensions, as may be judged from the fact that at Dawib a homogeneous mass of cassiterite weighing 500lb. was found some years ago. The mineral has usually a yellowish-brown colour and is of remarkable purity. At Otjimboyo true *ruby tin* is found, and also a beautiful brown, transparent variety of cassiterite. The cassiterite appears in some instances to have crystallized contemporaneously with the remaining constituents of the pegmatite. In other instances it is clearly of later origin, being developed along cracks and narrow fissures in the pegmatite. Where this is the case, it is, as a rule, quite evident that the cassiterite and the muscovite, by which it is generally accompanied, have replaced metasomatically the original quartz and felspar of the rock. Some of the larger veins of pegmatite enclose tabular masses and bodies of pegmatic quartz containing cassiterite, which is usually concentrated along the contact between the pegmatite and the quartz. In illustration may be cited one of the veins exposed to the west of the homestead on Ameib. At this particular point the pegmatite was itself quite barren of cassiterite. The pegmatites, as previously indicated, are intrusive in the rocks of the Schist Formation, which in the area under review include mica-schist, quartzite-schist, phyllite, knotted phyllite, quartzite and marble. The strike of these rocks varies from E.N.E.-W.S.W. to E.S.E.-W.N.W., and they are everywhere found dipping at fairly steep angles (45 to 60 degrees). The pegmatite veins and lenses frequently conform to the strike and dip of the schists and metamorphosed sediments, and where this is the case appear to occupy cavities produced during the folding of these rocks, which was probably connected genetically with the intrusion of the granites and pegmatites. In many instances, however, the veins cut across the planes of schistosity of the metamorphic rocks. Along their contact with the larger intrusions of pegmatite, and especially with those that cut across them, the schists and altered sediments have frequently undergone tourmalinisation. More rarely, as at Kohero East and Otjimboyo, they are finely impregnated with cassiterite. Practically all the veins hitherto opened up have proved to be very poor and patchy as regards ore-contents, the cassiterite being remarkably erratic in its distribution, while the veins themselves were in many instances found to "peter out" within a comparatively short distance of the surface. The results obtained from their exploitation have in consequence up to the present been very disappointing. Indeed, only in one instance, namely, at the Kohero East Mine (Anglo-German Tins, Ltd.), has anything like a successful showing been made. This little mine had, prior to the outbreak of the war, yielded about 120 tons of concentrate, averaging over 70 per cent. of metallic tin. It has been opened up to a depth of 92 feet. At this depth the pegmatite body disappears completely. The country-rock (mica-schist) is, however, finely impregnated with tourmaline and cassiterite along a continuation of the line of fissure, and it is hoped by following this impregnation zone to strike further bodies of pegmatite.

Alluvial and Eluvial Deposits.—At Chatputz, to the north-west of Ameib, at Otjimboyo on the Khan River, at Tsomtsaub, Aubinhonis and Neineis to the south-west of Okombahe, and at Kawab to the south-east of that locality, the disintegration and denudation of the tin-bearing pegmatites have given rise to the formation of deposits of stanniferous gravel and "float." In these deposits the cassiterite occurs in sub-angular and rounded grains and fragments, which are accompanied at Neineis, Aubinhonis and Chatputz by occasional well-worn nuggets of gold. Most of the detrital occurrences have been exploited or tested, and fairly good results were in some instances obtained. On the whole, however, they were found to be poor and of inconsiderable extent. Most of the good ground appears by this time to have been worked out. The usual methods of exploitation adopted in connection with these deposits consists in excavating the ground by hand, using picks and shovels, sifting it in swinging or revolving screens, and then washing the screened product in hand-operated, movable-sieve jigs. At Chatputz, where rich accumulations of "float" and alluvium are said to occur, a large storage dam, which was to supply the water for a hydraulicking scheme, was built in 1913. It was unfortunately destroyed during the recent campaign. In the year 1913 the primary and detrital deposits dealt with in the preceding paragraphs yielded tin-ore to the value of £31,568.

VANADIUM.

The occurrence of mottramite (copper-lead-vanadinate) at Tsumeb and Asis East has already been mentioned. The mineral is also found in the Grootfontein District at Rietfontein, to the north of the farm Ghauss, on the north-eastern portion of the farm Nosib, and at Harubib, north of Berg Aukas, where it is associated with cerussite. From the occurrence at Rietfontein several tons of mottramite, averaging about 7 per cent. V_2O_5, were obtained. It was all found on the surface.

WATER.

The question of water supply, of fundamental importance in a country like South-West Africa, with its vast areas of desert and semi-desert and its periodically recurring droughts, can only briefly be touched upon, a full treatment of the subject being beyond the scope of the present report. To certain of the sources of surface supply, like pans, vleis and sink-hole lakes, some reference has already been made. In the Highlands of Central Damaraland important accumulations of rain-water in natural rock reservoirs occur at many localities. Some of the farmers on the Khomas Highlands appear to be entirely dependent on such reservoirs, which often carry water all the year round. There are a number of fine storage dams in Damaraland, and, in view of the fact that admirable sites for such dams abound in this portion of South-West Africa, it is surprising that more have not been constructed.

Rivers.—With the exception of the large rivers along its boundaries, South-West Africa, as already pointed out, contains no perennial streams, but is traversed by numerous periodical rivers. These are of the utmost importance from the standpoint of water supply, because, quite apart from the fact that some of them "come down" each rainy season, there is almost invariably a steady flow or seepage of underground water below their beds. Where this underground water is dammed up by natural obstructions, such as bars and dykes of impervious rock, it not infrequently gives rise to perennial pools in the river beds, or there may actually for some distance be a slight flow or trickle at the surface, as in the Omaruru River at Omaruru. Where, as is more usually the case, the water does not rise to the surface, it can easily be tapped by sinking shallow wells in or alongside the river beds. Numerous farmers throughout the country, and even some of the larger communities like Swakopmund, are dependent on such wells. Excellent results have been obtained by putting down boreholes in some of the sand and detritus choked river valleys of the Namib. The boreholes at Garub, for example, which yield about 140,000 gallons per diem, were sunk in a valley of this description. The water was actually struck in decomposed mica, rich gneiss forming the valley bottom. Large supplies of water of excellent quality have also been proved by boring to exist in the sand-choked valley of the Kuichab River, some ten miles to the north-west of Garub. Pumping tests made in connection with these boreholes were so satisfactory that it was decided in 1913 to supply Lüderitz from them, and provision was actually made in the 1914-15 Estimates for the construction of a pipe-line, pumps, etc.

Thermal Springs.—Springs yielding heated water of much the same composition as ordinary spring water occur at quite a number of widely separated localities in South-West Africa. They invariably issue from fissures or faults, and their water evidently comes up from very considerable depths. The water is in some instances slightly charged with sulphuretted hydrogen and carbon dioxide. The hottest as well as the most productive springs are those at Windhuk which supply that town with water. They are five in number and appear to be aligned along a fissure in mica-schist. The following list gives the localities and temperatures of the more important hot springs in Damaraland and Great Namaqualand:—Damaraland: Windhuk, 172° F.; Omburo, 170° F.; Otjikango, 149° F.; Rehoboth, 128° F. Great Namaqualand: Aias, 131° F.; Ganikobis, 104° F.; Warmbad, 100° F. Hot springs also occur in the Kaokoveld at Numas, Warmbad, and in the neighbourhood of Oruwanje.

Ordinary Springs.—Copious springs issue from the Otavi dolomite at Rietfontein, Otavifontein, Otavi and several other localities in the Grootfontein District. They evidently represent the surplus discharge from large accumulations of underground water in that formation. There are also very important springs along the southern foot slopes of the Great Waterberg, but no information regarding them is available. Quite a number of good springs are said to occur in the Gobabis District, and at Goamus, to the east of Gibeon, several issue at the base of the Karroo Sandstone Beds. At Knibis, Bethany, and Haris-Tsachanabis in Great Namaqualand there are important fault springs. At the first named locality the water issues along the faulted contact of Knibis quartzite and Schwarzkalk. At Buntfeldschuh, in the extreme southern portion of the Lüderitz Bay diamond fields, an important spring issues at the junction of the Tertiary marine sandstones, previously referred to, and the underlying folded lower Nama beds.

(To be continued.)

Correspondence and Discussion.

Comments on Questions Arising in Technical Practice or Suggested by Articles in the Journal—Views, Suggestions and Experiences of Readers.

Our Sailors: Lady Beatty's Appeal.

To the Editor, *South African Mining Journal.*

Sir,—I am asking for gifts towards the excellent work of the British and Foreign Sailors' Society to be announced at their 98th annual gathering at the Mansion House, London. The Society is both International and Interdenominational, and is the oldest organisation looking after the all-round interests of our sailor lads. It has long enjoyed the patronage of the Royal House, and continues to receive the regular support of all the churches, as well as the leading members of the Naval, shipping and commercial circles. Even more important than all, I am convinced that the Society has a real place in the hearts and lives of our brave sailors, and as a small reward for their splendid courage and endurance I hope that you will generously assist this glorious enterprise. I am sure you will agree with me that it is not only necessary to maintain this work at its present high level, but also to extend its activities in other centres where our sailors are in urgent need of institutes ashore for the effective supply of their social and spiritual wants.—Very truly yours,

ETHEL BEATTY.

Hanover Lodge, Regent's Park, N.W.
27th April, 1916.

Far East Rand Geology.

To the Editor, *South African Mining Journal.*

Sir,—In the "Memorandum of the Far East Rand" by the Government Engineer laid before Parliament just lately, I see that that gentleman credits the farm Holgatfontein No. 127—Nigel district—with 180 claims of Dr. Mellor's own sub-outcrop of Main Reef Leader—alias Van Ryn or Nigel. As a matter of fact there is very little sub-outcrop attached to the Nigel formation on Holgatfontein, for it comes round with a bold sweep from Bultfontein and trends up through the "L" of Holgatfontein (vide map) into Vlakfontein No. 21, where nowhere in the first mile can there be more than 150 to 200 feet of surface soil, etc., covering it. There are hundreds of yards of Nigel formation on Holgatfontein running due north and south, with reef debris everywhere, and I am confident that closer inspection would credit the farm with five times as many claims as Government allots it. No previous maps of that district have given it any at all, as all geologists and would-be experts, without exception, have mistaken the formation on Marievale for the Nigel extension; so, therefore, I suppose, Holgatfontein should be thankful for small mercies for the moment, and graciously accept the 180 claims from the Government Mining Engineer as an instalment of what was bequeathed it by Nature, until the case is settled before the coming Commission and the next session of Parliament. Had the controllers of Vlakfontein, when they were drilling some years ago, devoted their attention to the southern portion of the farm, where the covering is insignificant, instead of the northern, they would be working to-day as an outcrop proposition, and everything north in the way of Nigel would have had to take its tune from them. Instead of which the Northerners have had all the say, and whatever they get at depth of payable reef matter lying on shale, be it Black Reef or what not, is Van Ryn or Nigel all the same. What the Far East Rand "delta," as Dr. Mellor pictures it, owes to Black Reef series there are few who know, and fewer still who have the courage to acknowledge it, but one day the truth will out, and there will be such a rush for the remaining 30,000 square miles of it west and south, etc., as never was.—I am, etc.,

SCOTT ALEXANDER,
"Rand Stratigraphist."

Johannesburg, June 20, 1916.

The South Village Deep.

To the Editor, *South African Mining Journal.*

Sir,—Shareholders of the South Village Deep Company, who have been waiting patiently for years for their turn to come, will be gratified to learn from the report of the annual meeting of its neighbour the Village Deep Company, held yesterday, that the working of their mine so far south as Springfield and La Rochelle is contemplated, inasmuch as it must help to bring the exploitation of the South Village Deep property (which, I may say, is situated not far from the last mentioned township) much nearer fruition. This should be good news for the South Village Deep, and materially raise the prospect of their deep level ground becoming a workable proposition sooner than anticipated.—Yours, etc.,

S. V. D. SHAREHOLDER.

Johannesburg, June 20, 1916.

ANSWERS TO CORRESPONDENTS.

All inquiries addressed to the Editor must bear the writer's name and full address. We cannot reply to inquiries by letter, but telegrams with replies prepaid will be answered. Correspondents are requested to write their names and pseudonyms distinctly.

'Ebani."—You should certainly hold for a better market.

E.L.—The concern is purely a Capetown affair, and is unknown here.

W.R.M.—(1) Yes; (2) certainly; (3) yes.

"Constant Reader."—The directors themselves hardly know yet. Time alone can tell.

E. F. B.—Hold.

"Zonnerlust" Capetown.—Next week.

THE TRADE SCHOOL.

In the "Teachers' World," Dr. W. Ripper, Professor of Engineering at Sheffield University, makes a plea for the trade school as a means of training our industrial workers. "There is a great future for it," he writes, "not merely as an institution to prepare pupils to become more effective wage-earners or profit-producers. The greatest of all its functions will be to increase the interest of the worker in his trade, to broaden the worker's outlook, to help him to realise something of the history and traditions of his trade and of the part it plays in the world of industry, to learn how the trade is conducted in other countries, to know something of the economic laws upon which it depends, to inspire the pupil with something of the joy and pride in his trade which was so long the possession of the craftsmen of the olden time and is still, of course, to-day possessed by highly skilled workers in very many trades, to learn that there is nothing more honourable or worthy than to be a skilled craftsman in a trade which is respected and valued in proportion to the service which it renders in the world."

THE WEEK IN THE SHAREMARKET.

Dull and Depressed— Fluctuations in Spring Mines.

THE general weakness of the market has continued all through the week, and in certain cases has been accentuated. The main feature of interest was provided by Springs Mines, in which there has evidently been heavy liquidations. Twice they were dropped to an extreme figure and raised again, and for the third time they had a heavy fall on Thursday. Geduld Proprietaries gave way to a point below that which they have ever touched since their advance into the forties some months ago. Everything small has been a source of weakness with the exception of Apex, Jupiters and Roodepoort United Main Reef, African Farms, Bantjes, Knight Centrals and Randfonteins, together with tin stocks, continue in an unsatisfactory condition. On the other hand, Modder B's and Deeps keep firm at a somewhat lower level, the former passing without quotation on 'Change for two days' running. New Modders maintained their top price. Kleinfonteins have been somewhat more satisfactory. The following stocks show little or no differences, Brakpans, City Deep, City and Suburban, Consolidated Langlaagte, Pretoria Cements, Coal Trusts, Van Ryn Deeps and Knights. As was the case during the previous week, prices continue mainly below London level. There seems no immediate prospect of recovery, as those in a position to invest are holding back for lower rates, while others have apparently as much, or more on hand than they can carry. The aggregate amount locked up in purely speculative low-priced goods must represent a considerable sum and also a considerable loss.

	Fri., 16th.	Sat., 17th.	Mon., 19th.	Tues., 20th.	Wed., 21st.	Thurs., 22nd.
African Farms	8 9*	9 0*	9 3*	9 1	9 0	8 9*
Apex Mines	6 0	6 0*	6 0*	6 0*	6 0*	6 0*
Aurora Wests	—	—	—	12 3*	—	—
Bantjes Cons.	11 9*	12 3	12 7	11 3	11 3	11 1*
Blauuwbosch Diamonds	—	47 0*	—	—	—	—
Brapkan Mines	78 6†	78 0	76 6*	77 6*	77 6*	78 0
Breyten Collieries	—	19 6*	—	—	—	19 6*
Brick and Potteries	5 0*	5 0*	—	—	—	5 0*
British South Africa	—	11 0*	—	—	—	11 0*
Bushveld Tins	0 7	0 7*	0 6*	0 7*	0 7*	0 8
Cassel Coals	20 0*	20 0*	—	20 0*	20 0*	20 0*
Cinderella Cons.	7 0†	6 3*	7 0†	5 9*	—	5 9*
City and Suburbans	35 3*	35 3*	35 3*	35 0*	35 3*	35 3*
City Deeps	78 6*	78 6*	78 6*	78 3*	78 0*	78 6*
Cloverfield Mines	8 7	8 6*	8 6*	8 6*	8 4*	8 3
Clydesdale Collieries	—	12 0	10 0*	—	10 6*	—
Concrete Construction	3 6*	3 6*	5 0	4 0*	4 3*	3 9*
Cons. Investment	16 0*	15 0*	15 0*	15 0*	15 0*	15 0*
Cons. Langlaagtes	33 0*	33 3*	33 6*	—	34 0†	33 0*
Cons. Main Reefs	19 0a	19 0*	19 9	19 3*	19 0*	19 3*
Cons. Mines Selection	17 6†	—	—	—	17 0*	—
Coronation Freeholds	0 3*	0 5†	0 3*	0 3*	0 3*	0 3*
Coronation Syndicates	—	—	—	—	—	1 9*
Crown Diamonds	2 0*	2 0*	2 3	2 3*	2 3*	2 3*
Crown Mines	—	—	54 0*	54 0*	54 0*	54 0*
East Rand Centrals	8 3	8 0†	8 0*	8 3*	8 0*	8 3
East Rand Coals	3 3	3 2*	3 2*	3 1*	3 1*	—
East Rand Deeps	1 2*	1 2*	1 3*	1 3	1 3	1 2*
East Rand Mining Estates	—	13 6*	16 0†	16 0†	16 0†	16 0†
East Rand Props.	13 9*	14 0*	14 0a	15 0*	14 6*	14 6*
East Rand Debentures	£75*	£75*	£75*	£75*	£78*	£75*
Eastern Gold Mines	—	—	—	1 8†	—	1 8†
Ferreira Deeps	—	31 0†	31 0†	31 0†	—	—
Frank Smith Diamonds	2 0*	2 0*	2 3	2 3	2 3*	2 3*
Geduld Props.	41 6*	41 6*	—	41 0	40 0*	40 0
Geldenhuis Deeps	—	—	22 0*	22 6*	—	—
Glencairn Main Reefs	—	—	1 3*	1 4*	1 3*	1 5*
Glencoe Collieries	—	6 6*	6 6*	7 0*	—	6 6*
Glynn's Lydenburgs	16 6*	16 6*	16 6*	—	—	—
Government Areas	35 6	35 9	36 0	35 9*	35 0*	35 9
Jupiters	6 6	6 9	7 0	7 3	7 0*	6 9*
Klerksdorp Props.	2 1*	2 0*	2 0*	—	2 1*	2 2*
Knight Centrals	10 9*	10 10*	10 9*	10 9*	11 9	11 0
Knights Deeps	—	—	23 6†	—	23 6†	—
Lace Props.	5 0	5 2	5 2	5 0	5 0	5 0
Luipaardsvlei Estates	7 6*	—	8 0	—	—	—
Lydenburg Farms	7 0*	7 0*	7 0	—	7 0†	6 9†
Main Reef Wests	6 3*	6 6*	6 3*	6 3	6 3*	6 3*
Middelvlei Estates	1 3	1 3*	1 1*	1 1*	1 1*	1 1*
Modderfontein B.	133 6*	135 0a	—	—	134 0*	134 0*
Modderfontein Deep Levels	133 6	133 0	132 6*	133 0*	133 0*	133 0
Leeuwpoort Tins	15 9	15 0*	15 0	15 0†	13 6*	13 9*
Natal Navigation Collieries	16 6*	16 6*	17 0†	16 9*	16 9*	—
New Boksburgs	1 8*	1 8*	1 8*	1 8*	1 8*	1 8*
New Eland Diamonds	19 0†	15 0*	16 0*	15 0*	17 6†	—
New Era Cons.	8 0*	8 0	8 0*	8 0	7 9*	7 9*
New Geduld Deeps	5 2	5 0*	5 1*	5 0*	5 0	5 0
New Kleinfonteins	26 0*	26 3	26 3*	26 9	26 6*	26 9
New Modderfonteins	337 6	—	337 6h	337 6*	340 0a	—
New Rietfonteins	—	1 0†	0 8*	—	1 0†	0 6*
New Unifields	—	13 0†	—	13 0†	13 0†	—
Pretoria Cements	71 0*	—	—	72 6†	72 0*	72 0*
Princess Estates	1 9*	1 9*	1 9*	1 9*	2 0	1 9
Rand Collieries	3 0*	3 0*	3 0*	—	3 0*	3 0*
Rand Klips	7 3*	7 6*	7 3*	7 6*	7 3*	7 3
Rand Nucleus	1 9*	1 9*	2 0†	1 9	1 9*	1 9*
Randfontein Deeps	4 0†	4 0†	3 9*	—	4 0†	—
Randfontein Estates	—	10 9*	11 0b	—	11 0*	—
Roodberg Minerals	13 0*	13 3*	13 3*	13 3*	13 3*	13 0*
Roodepoort Uniteds	9 0	9 6†	—	—	9 0*	8 9*
Ryan Nigels	—	—	—	—	2 7*	—
Shebas	2 0*	2 3	2 0*	2 6†	2 6†	2 3*
Simmer Deeps	1 10*	2 0†	1 11*	—	—	—
S.A. Lands	4 1	4 1*	4 2	4 1*	4 0*	3 10*
Springs Mines	51 0	51 0	51 3	51 6	52 3	51 9
Sub Nigels	16 6*	16 3*	17 0	16 9*	16 9	16 9
Swaziland Tins	—	27 0*	27 0*	27 0*	27 0*	27 0*
Transvaal and Delagoa	60 6	—	—	—	—	—
Transvaal Coal Trust	66 3*	65 6*	66 4½	67 0	66 6*	67 0
Transvaal Lands	15 3†	15 3†	15 3†	—	—	15 3†
Transvaal G.M. Estates	—	22 0*	23 0*	22 6*	22 6*	22 6*
Van Ryn Deeps	—	69 0*	69 3	69 6*	69 9	69 0†
Village Deeps	32 0†	32 0†	32 0†	32 0†	—	—
Vogelstruis Cons. Deeps	—	1 0*	1 3	—	—	—
West Rand Consolidated	6 0*	6 0*	6 0*	—	—	—
Western Rand Estates	1 0*	1 0*	1 0*	—	1 0*	1 3*
Witbank Collieries	—	41 6†	—	41 6†	—	41 6†
Witwatersrands	58 6†	56 0*	56 0*	56 0*	56 0*	56 0*
Witwatersrand Deeps	—	25 3*	25 3*	25 6*	25 0*	26 0†
Wolhuters	—	10 0*	10 0*	—	10 0*	10 0*
Zaaiplaats Tins	9 9	9 11*	10 0*	9 9*	9 9*	9 9*
Steyn Estates	—	—	—	1 10*	—	—
Union Stock, 3½ per cent.	—	—	—	—	£78*	—
Union Stock, 4 per cent.	—	—	—	—	£82*	—

a Odd lots. * Buyers. † Sellers.

Record Tonnage Hoisted.

"In your journal of Jan. 1, 1916, M. R. Percy asks for the record tonnage hoisted through two compartments of a shaft. I do not know of any better record than that of the Crown Mines here in May, 1914, 26 working days, when 16,530 skips, each carrying 8 tons, a total of 132,240 tons, were hoisted from a depth of 2,400 ft. As far as I know, this work constitutes a world's record," Mr. C. M. Rasmussen writes from the Crown Mines, Johannesburg, South Africa, under date Feb. 24, 1916, to the *Engineering and Mining Journal of New York*.

Capetown Consolidated Tramways and Land.

The report of the Capetown Consolidated Tramways and Land Company for the year 1915 shows a debit balance of £817, as against £1,894 6s. 9d. for the previous year. Arrangements were completed during the year, postponing redemption of the First-Charge Mortgage Debentures until 1st July, 1921, and also postponing the payment of the interest till 30th June, 1920, unless meantime the profits are sufficient to permit of payment of the interest being resumed sooner. Regarding the subsidiary companies, the report shows that the Camps Bay Tramway earned a profit of £1,486, against £1,521 in the previous year. The Cape Marine suburbs worked at a profit of £498, against a loss of £1,865 in the previous year. The land sales amounted to £783. The Oranjezicht estate shows a loss of £633, against a profit of £605 for the previous year.

Transvaal Coal Trust Ltd.

(Incorporated in the Transvaal.)

Declaration of Interim Dividend No. 33.

NOTICE IS HEREBY GIVEN that an Interim Dividend of 12½ (twelve and one-half) per centum, equal to 2s. 6d. (Two Shilling and Sixpence) per share, has been declared by the Board for the half-year ending 30th June, 1916.

This Dividend will be payable to all Shareholders registered in the Books of the Company at the close of business on the 30th June, 1916, and to holders of Coupon No. 33 attached to Share Warrants to Bearer.

The Transfer Books of the Company will be closed from the 1st to the 7th July, 1916, both days inclusive.

Dividend Warrants will be issued to South African Registered Shareholders from the Head Office, Johannesburg, and to European Shareholders from the London Office, 5, London Wall Buildings, Finsbury Circus, E.C., as soon as possible after the receipt of the London Transfer Returns.

By Order of the Board,

The Consolidated Mines Selection Co., Ltd. (Eng.) Secretaries.
Per A. F. LYALL.

Postal Address: Box 888,
Head Office: "The Corner House,"
Johannesburg, 16th June, 1916.

Brakpan Mines, Limited

(Incorporated in the Transvaal.)

Declaration of Interim Dividend No. 9.

NOTICE IS HEREBY GIVEN that an Interim Dividend of 22½ (twenty-two and one-half) per centum, equal to 4s. 6d. (Four Shilling and Sixpence) per share, has been declared by the Board for the half-year ending 30th June, 1916.

This Dividend will be payable to all Shareholders registered in the Books of the Company at the close of business on the 30th June, 1916, and to holders of Coupon No. 9 attached to Share Warrants to Bearer.

The Transfer Books of the Company will be closed from the 1st to the 7th July, 1916, both days inclusive.

Dividend Warrants will be issued to South African Registered Shareholders from the Head Office, Johannesburg, and to European Shareholders from the London Office, 5, London Wall Buildings, Finsbury Circus, E.C., as soon as possible after the receipt of the London Transfer Returns.

By Order of the Board,

The Consolidated Mines Selection Co., Ltd. (Eng.) Secretaries.
Per A. F. LYALL.

Postal Address: Box 6249.
Head Office: "The Corner House,"
Johannesburg, 16th June, 1916.

JOHANNESBURG

Consolidated Investment Co., Ltd.

NOTICE IS HEREBY GIVEN that a Dividend of 5 per cent. has been declared payable to all Shareholders registered in the Books of the Company at the close of business on Friday, the 30th June, 1916, as soon as the necessary returns are received from the London Office.

The Transfer Books of the Company will be closed from the 1st to the 10th day of July, 1916, inclusive.

By Order of the Board,

W. FERGUSSON,
pro. Secretary.

Swaziland Tin, Limited.

(INCORPORATED IN THE TRANSVAAL.)

DIVIDEND No. 17.

NOTICE IS HEREBY GIVEN that an Interim Dividend, No. 17, of Fifteen per cent. (3s. per share) has been declared by the Board, payable to all Shareholders registered in the Books of the Company at the close of business on the 30th day of June, 1916.

The Share Transfer Books will be closed from the 1st day of July to the 7th day of July, 1916, both days inclusive.

The Dividend Warrants will be posted to Shareholders from the Head Transfer Office on or about the 15th day of July, 1916.

By Order of the Board,

TRANSVAAL CONSOLIDATED LAND & EXPLORATION CO., LTD.,
Secretaries.
W. E. S. LEWIS, Secretary.

Head Office,
The Corner House,
Johannesburg, 21st June, 1916.

THE CITY & SUBURBAN GOLD MINING AND ESTATE CO., LTD.

(Incorporated in Natal.)

NOTICE IS HEREBY GIVEN that a Dividend of 5s. per Share has been declared, payable to all Shareholders registered on the 30th June, 1916.

J. WEIGHTON, Secretary.

Head Office:
Pietermaritzburg, Natal,
15th June, 1916.

THE WEEK IN THE MINING MATERIAL AND ENGINEERING TRADES.

Jarring and Disturbing Elements in the Freight Problem—Mines Carrying Nearly Four Times the Value of Stores as Compared With Pre-War Times—American Quotations Show Signs of Easing—American White Lead at 62/6.

The freight question has created a jarring note throughout the higher commercial circles. The keynote of the position was the serious drop, reported in the early part of the week, in the freight from Canada and America for grain cargoes to Liverpool. The assumption is that the demand for freight for munitions has fallen off considerably, hence such a sharp drop being regulated by the ever present conditions of supply and demand. However, according to a produce merchant, the freight on maize from the Argentine to Britain has been easing off since May last, to the extent, from then till now, of 56s. per ton less. In support of this the price of maize has declined from about 50s. to 38s. 6d. per quarter, with a firming up to-day on account of the decreased crops in South Africa. As against this decrease in freight between America and Liverpool comes the rather surprising information that the freight between South Africa and London will be increased. Naturally freight conditions will quickly readjust themselves, because the "tramp" element on the seas to-day is an important, if not a deciding factor. Hence, if less freight is offering in any one portion of the globe, the "tramp" steamers will go to another, and so quickly make their presence felt against any artificial conditions existing.

Stocks on Hand.

It is very interesting, as well as instructive, to get an official authority for the quantity of stocks accumulated, since the war, by the mining industry. At the annual meeting of the Rand Mines the Chairman, Mr. E. A. Wallers, stated that "Prior to the war our companies held stocks to the value of £163,000, whilst at the end of last year, our stores had increased to a value of £457,000, being an increase of cash locked up of £294,000." Under this category very significant remarks were also made, that the higher cost of the stores had stimulated rigid economies. In this respect the managers had been very successful in many directions, and the Chairman added: "I am sure they will see to it that we hold fast to these economies when normal times return." Such remarks from such a high authority, coupled with the freight question, compel importers to pause and think of the future trade problems. One remarked only this week: "Our firm can easily lose £20,000 in their commitments."

The American Trade.

Following up the theory of a super-abundance of stores at the mines, and the sudden drop in freight, a cable, received this week from America was shown to the writer, wherein an offer was made to supply a certain commodity at a shade under pre-war rates, delivered at Durban, which is an indication that fears are entertained that the time may come when difficulties will arise, to find an outlet for the feverish production.

Market Notes.

At the beginning of the war there was a shortage of hammers, picks, shovels and similar goods. As time went on, merchants and importers, who had never previously handled such goods, ventured their prentice hand, much to their present chagrin, as a responsible broker states, there are sufficient of those small lines on hand in Johannesburg to last the mines another two years, particularly as the mine stores are so full up.

Iron and Steel.

The advance last week in steel plates has not had time to be assimilated, hence a decided check in business at the higher rates. The fact is that the mines are giving out very few orders, therefore the newer values have not been put to the acute test of tendering.

Chemical Glass and Testing Tubes.

The stocks originally imported from Europe have been absorbed, hence an acute shortage, especially for particular lines. However, it is said that this is now being relieved by importation from Japan.

Mining Poles.

The mines are arranging for six and twelve months' supplies. The prices are nominally the same, but shrewd observers think that when the tenders are opened, the "cut" prices will be on the easier side. Here again prentice hands and speculators have gone into this apparently "easy" business.

Timber and Building Materials.

The demand for timber and bricks has fallen off, particularly this month. The price of deals is still the same, viz., from 1s. to 1s. 3d., and may be on the easy side if a big contract can be placed, simply because of the slackness in the demand and the anxiety to book a line.

Agricultural Machinery.

The travellers from the country districts report a dearth of orders, chiefly because the maize crops are particularly bad in parts, and the Government official returns confirm these poor reports, in the aggregate..

Battery Fittings.

The orders for the year 1917 given out at the beginning of the month, have not been fully arranged, therefore some groups are still much in evidence in this respect.

Prospecting Outfits.

In consequence of the Government Bill in reference to the working of the Far Eastern Rand Areas being held over for another session, several preliminary orders for prospecting outfits have been cancelled.

Miscellaneous.

There was an inquiry in town for a large weighbridge for weighing road wagons and trucks. Piping for mine sizes for spuring, is still scarce and in demand. Second-hand tramway material was secured this week from Rhodesia. A couple of weighing machines, as well as a small lot of wheelbarrows were sent to a coal mine in Natal.

Galvanised and Thatch.

Owing to the abnormal cost of galvanised roofing iron, many farmers and poultry keepers are using reeds and other suitable material for thatching the pens and outhouses.

White Lead.

Quite a little flutter has recently occurred with holders and importers of British white lead. It appears that two or three decent-sized consignments of white lead have been imported into Johannesburg from America. On arrival here the price of the British article was 72s. 6d. to 75s. per 100 lbs (since 70s. to 72s. 6d.), when the American product was offered at 70s., and as it did not catch on, the price was subsequently reduced to 65s., then, on Thursday of this week, a wholesale parcel was offered at 62s. 6d. Whatever the eventual results, the Americans are undoubtedly in the South African field to dispute the trade with the Britishers.

Revised Price List.

Approximate war prices, subject to quick change.—Mining and building hardware: Iron, imported, round up to 1 in., 30s.; 1⅛ in. to 2 in., 13s. 6d.; 2¼ in. to 6 in., 25s. per 100 lbs. Do., square, up to 1 in., 27s. 6d.; 1⅛ in. to 2¼ in., 13s. 6d.; 2½ in. to 5 in., 25s. Flats, 3-16 in.,

37s. 6d.; all from ¼ in. up, 25s. Angles, ⅛ in. to 3-16 in., 30s.; ¼ in., 27s. 6d.; 5-16 in. to ¾ in., 25s., excepting 5 x 4 x ⅝ in.; mild steel bar, 3½d. lb.; drill, 6½d. lb.; steel plates, 10ft. by 4ft. by 1-16th inch., 32s.; ⅛ inch by 3-16 inch., 30s.; ¼ inch to 5-16 inch, 28s. 6d.; ⅜ inch, up to 27s. 6d. ½ 10ft. by 5ft. by 1-16 inch, 34s.; ⅛ inch and 3-16 inch, 31s. 6d.; ¼ inch to 5-16 inch, 30s.; ⅜ inch, up to 29s.; intermediate sizes up to 12ft. by 6ft. by 1-16 inch, 35s. 6d.; ⅛ inch and 3-16 inch, 32s. 6d.; ¼ inch and 5-16 inch, 30s. 6d.; ⅜ inch and up, 29s. 6d., all at per 100 lbs.; hexagon bolts, ⅜ in. to 3 in., 8d. per lb.; over 3 in., 7d. lb.; ½ in. up to 2½in., 50s.; 2¼in. to 6in., 47s. 6d.; 6½in. and over, 45s.; ⅝in. up to 2¼in., 45s.; 2⅜in. to 6in., 42s. 6d.; 6½in. and up, 37s. 6d.; ¾in., ⅞in., and 1in. up to 2½in., 40s.; 2⅜in. to 6in., 37s. 6d.; 6in. and up, 32s. 6d. 100lb. Nuts, ⅜ in., 9d. lb.; ½ in., 50s.; ⅝ in. to 1¼ in., 47s. 6d.; 1⅝ in. to 1¾ in., 52s. 6d. per 100 lbs.; 2 in., 7½d. per lb.; washers, ¾ in. and under, 37s. 6d., and above that size, 32s. 6d. per 100lb.; shoes and dies, 32s. 6d. to 35s. per 100lb.; rails, £20 per ton; picks, 4 lbs., 27s. per doz.; shovels, 32s. 6d. to 50s. per doz.; hammers, drill, 7½d. to 9d. lb.; hammer handles (best American), 14 in., 3s. 6d., 24 in., 5s. 6d., 30 in., 7s. 6d., 36 in., 10s. 6d. per doz.; metal, anti-friction, 1s. per lb.; galvanised iron, 24 gauge, 6 ft. to 10 ft., 10d., 11 ft. 10¾d., 12 ft. 10¾d.; 26-gauge, 6 ft. to 10 ft., all lengths, 8¾d. to 9¼d. per ft. all-round; flat galv., 18 to 24 gauge, 32s. 6d.; 26 gauge, 34s. 6d. 100 lbs.; floor brads, 30s.; ceiling, 30s.; wire nails, 29s. to 32s. 6d. per 100 lbs.; solder, 50 per cent., 1s. 2d. per lb.; locks, rim, 45s.; mortice, 60s. doz.; barbed wire, 22s. 6d. to 25s. 100 lbs. coil.

Timber: Deals, Baltic, 9 x 3, up to 16 ft., 1s.; over, 1s. 1d. to 1s. 3d. (Oregon, 11¼d.); flooring, 4½ x ⅞ and 6 x ⅞, 6d. to 6¼d. per sq. ft.; do., 4½ x 1⅛, 7d.; and 6 x 1⅛, 7d.; Oregon edge grain, 6d. to 7¼d.; ceilings, 6 x ½, 3¾d. to 3¾d. per sq. ft.; Oregon, 4 x ½, 4½d.; pitch pine, 7s. 6d. to 7s. 9d. per cub. ft.; Oregon, 5s. 6d. per cub. ft.; clear pine, ½ in. x 12 in., 7½d. per ft.; 1 in. x 12 in., 8d.; teak, small planks, 15s. per cub. ft.; do., large, 16s.; jarrah, 8s. 6d. per cub. ft.; poplar, 1 in. x 12 in., 9d.; scantling, 9 x 3, 11½d. to 1s. 1d. per ft.

Bricks, cement, lime, etc.: Cement, nominal, 34s. 6d. per cask; Pretoria Portland, 9s. 3d. per bag; 8s. 3d., truck loads; lime, white, 7s. 9d.; truck loads, 6s. 9d., slaked; do., 5s.; blue, 3s. 6d.; plaster lime, 4s.; bricks at kiln, stock, 30s. to 42s.; wire cuts, 40s. to 50s. pressed, 65s. per 1,000, road transport getting scarce; salt and white glazed bricks, £27 10s per 1,000; tiles, roofing, £17½ square; glazed tiles, 10s. 6d. to 17s. 6d. yard; paving cement tiles, 8s. 6d. yard laid; terra cotta tiles, £15 per 1,000; reinforced concrete columns, 6 ft. plain, 22s. 6d., fluted, 24s.; fireclay bricks, £9½, good average, per 1,000; clay chimney pots, 80s. per doz.; fireclay, 37s. 6d. ton on rail.

Oils, paints, lead, oxides, glass: Linseed, raw, 29s. 6d.; boiled, 29s 6d per 5-gall.; white lead, 70s to 72s 6d per 100 lbs; turpentine, 52s 2/4 galls.; 10/1, 57s.; coal tar, imported, 10s. to 12s. 6d. per 5 galls.; oxide in oil, 33s. 6d. to 37s. 6d. per 100 lbs.; dry oxide, 21s. to 22s. 6d.; S.A. crude oxide, 12s. 6d.; linseed oil putty, 4s. 6d. per 12½ lbs.; bladders, 35s. casks of 100 lbs.; grease A.F. axle, 23s. 6d. to 25s. per 100 lbs.; tallow 1s. per lb.; White Rose paraffin, 15s. 9d. 2/5; Laurel do., 15s. 6d.; petrol, 26s. 6d. 2/4; motor oil, 6s. to 7s. 9d. per gallon; lubricating oils, 26s. per case; cylinder, 35s.; paints in tins, 10d. to 1s. per lb., according to quantity, and if ordered to be mixed, 15 per cent. on pre-war rates. British plate-glass, ¼ in., 3s. 6d.; do., mirror, 4s. 6d.; window, 16 oz., 1s. to 1s. 3d. ft.

Chemicals: Mercury, £18½ per 75 lb. bottle; bichromate potash, 1s. 6d. lb.; chlorate, 3s. 6d. lb.; permanganate, 7s. 6d. lb.; alum, 7d. lb.; carbolic acid, 10s. lb.; borax, 66s. 100 lbs.; cyanide soda, 1s. 6d. lb.; hypo, 9d. lb.; acetate lead, 67s. 6d. 100lb.; litharge (assay), 75s., (commercial) 50s. 100 lbs.; zinc sheets and blocks, 1s. 3d. lb.; plumbago crucibles, 6d. per number.

Electrical Goods: Lamps, high volts., British, Holland & American, 16s. to 21s. wholesale, and 21s. to 27s. dozen, retail; carbon lamps, 7s. 6d. per dozen; pure rubber flex, 9d. to 1s. per yard; 3/20 coils of wire, 30s.; do., 3/22, 26s.; tubing, 12s. to 13s. 100 ft.; keyholders, 2s. 6d. each; round blocks, 3½ in., 4s. dozen; lamp holder cord grips, 15s. doz.; switches, 5 amp., 13s. to 14s. doz.; British glass shades, 24s. to 36s. doz.; Bohemian shades finished; porcelain shackles, 14s. 6d. doz.; do., bobbins, 16s. 6d. to 18s. 100; cleats, 18s. per 100; P.O. insulators, 18s.; motors, 3 h.p., about £28 to £35, new.

Mr. Bernard Price has been elected President of the S.A. Institution of Engineers.

At the twentieth annual meeting of the Chemical, Metallurgical and Mining Society, to be held at the School of Mines on Saturday evening, the 24th instant., Mr. A. J. Brett, the General Manager of the Crown Mines, and President of the Association of Mine Managers, will submit a paper on "The Encouragement of First Aid on the Mines: Some Suggestions Made on Crown Mines Experience." Those interested in this subject are cordially invited to attend.

Reuter's Agency cabled last week, what has been known for some time on the Rand, that the South African gold mining industry, taking time by the forelock, has arrived at an important decision in connection with the safeguarding from German competition of the one British industry which has come to its own since the war. A contract has just been concluded between a majority of the Witwatersrand mining groups to be followed, it is understood, by all the mining companies in Rhodesia, under which they will draw all cyanide supplies in war time, and for five years after the war, from the Cassel Cyanide Company of Glasgow, a minor portion being contributed by the British Cyanide Company.

As an instance of the straits to which South American railways are driven in the matter of fuel, it is reported that one of the leading Argentine railways had to make a contract for 80,000 tons of coal from the United States, and although not to be compared in quality with Welsh steam coal, the price, delivered in Argentina, is within a fraction of £5 a ton. This figure compares with an average of between 35s. and 40s. a ton in normal times. The companies are said to be economising in every possible way by using wood and other substitutes for coal wherever practicable, and some saving in mileage is also being secured.

The Union of South Africa, by altering recent regulations, prohibits exports of iron and steel smelting scrap, magnesite, solid drawn steel tubes, material for wireless telegraphs, and haematite pig iron, to all destinations, except with the permission of the Commissioner of Customs and Excise. The Commissioner has power to sanction shipments of coal for bunkering only. The Union also prohibits the export of copper or copper manufactures and silica bricks to all foreign countries in Europe and on the Mediterranean and Black Seas other than France, Belgium, Russia (except through Baltic ports), Italy, Spain and Portugal.

Swazi Tin May Output.

The following are the results of the operations of this company for the month of May, 1916:—Concentrates recovered, 41 long tons; estimated profit (taking the price of tin at £165 per ton), £1,981; to which must be added (being adjustments in respect of previous shipments), £206; total, £2,190.

Engineering Notes and News.

MACHINERY ACCIDENTS ON THE GOLD MINES OF THE WITWATERSRAND.

[By C. B PATTRICK.]

Many points have been raised in the discussion, but, since they seldom overlap, it will be convenient to take the remarks of each person separately rather than to group in subjects. Mr. Austin suggests that the publication of detailed information respecting accidents which have occurred would tend to prevent their recurrence. Such publication would probably do good if read. If, however, the editors of local papers considered that the public were interested in such cases, would not they publish the details of the proceedings in the Inspectors' Courts as regularly as they do the particulars of the cases tried in the Magistrates' Courts? Mr. Austin further states that inspectors often pass by fencing, and afterwards prosecute engineers for having such fences. The reply to that is that neither under the Act nor the Regulations is an inspector authorised to approve fences. A Government inspector has to approve certain specified machinery, such as boilers and winding plants, but the general responsibility for compliance with the remainder of the regulations rests with the user or his representative. This was explained in the body of the paper. Mr. Austin's reference to allegations of perjury are unintelligible, since no such allegation was made in the paper. If such an allegation is to be read in, then half the witnesses on losing sides in cases held in the law courts are perjurers. Mr. Whittome states that whenever the regulations were intended to make it impossible for a man to pass a line without wilfully breaking down the erection put to warn or to stop him, the term "barricade" was used. In the regulations the word "fence" is frequently used to denote an obstruction which will prevent persons from inadvertently incurring danger. The three paragraphs of regulation 181, if read together, make this clear, and regulation 4 confirms this reading. Regulation 7 reads "fenced off to prevent access." Regulation 8, paragraph (3) conclusively proves that, where the conditions call for it, fencing may have to be very close or even solid. The wording is: " . . . shall be securely fenced off so that persons working therein shall be protected against danger from stones or material falling down such shaft, winze . . . . ." If a person desires to commit suicide he will climb over, or through, or under any fence; but the author maintains that the true meaning of the word "fence" in the regulations is not a mere one-bar handrail, but such a precautionary appliance as will give protection from injury under all conditions which are reasonably normal at the place in question. Mr. Whittome's twit regarding "vicious policy" does not apply, because, as previously pointed out, inspectors do not "pass" or "approve" fencing. On various occasions the author has been asked by resident engineers to look round fencing with them because they were too familiar with the plant easily to see its defects. The advice and experience of the author has been willingly given on these occasions, but, at the same time, such advice would not necessarily relieve the engineer of his legal responsibilities, because such advice is not included in the legitimate work of an inspector of machinery. As far as the author is aware, no accident has occurred, and no prosecution has been instituted in respect of any fencing thus unofficially examined. Mr. Whittome asks if a consistent attempt is made by both employer and employee to obey the whole of the regulations. In some instances this is most certainly so, but the author fears that a certain class of persons regard the regulations much as a fashionable lady regards the Customs, i.e., as something which may be legitimately evaded without dishonour. This question is largely answered by Mr. Bernard Price, when he states—"It would almost seem that those employees who, from the nature of their work, should best realise the risks entailed, are in course of time most likely to become callous." With regard to the inspection of winches hauling from winzes, the author can only say that, as far as he is aware, proper log books are kept, in which the inspections are recorded. If false entries were made, and evidence of that fact were placed at the disposal of the Department of Mines and Industries, it would be a serious matter for the person making such entries. The wrongful possession of keys for locked-bell boxes is a matter for mine discipline, and is dealt with by an inspector of mines. The author has no knowledge of any breach of this regulation. Mr. Whittome suggests that hardship and possible injustice result from enquiries being closed too soon. The early closing of an enquiry may entail a hardship in some cases, but the author has never had such a case brought to his notice, and is satisfied that such cases are rare. To claim that they are frequent would be to attribute incompetence or neglect to the officers holding such enquiries. As a matter of fact cases are reopened if it is represented to the Inspector that vital evidence has become available which was not forthcoming at the original enquiry. If all cases are to be investigated twice, the number of inspectors must be largely increased. Where the evidence of natives is required it is necessary to hold the enquiry as early as possible, and if this can be done before natives go off shift, so much the better. After reaching the compound, natives hold a consultation over any accident they may have been in, or have witnessed. They come to a decision as to how it occurred, and when called on to give evidence on the following day, they will give the version arrived at on the previous evening. It is most difficult to tie a native down to hard facts. One concrete instance will explain what is meant. Boiler-cleaners had been scalded owing to the wrongful opening of a valve which was situated behind a battery of boilers. This valve could not be seen from any gangway or normal working place, and yet eight natives came forward and stated that they saw the valve opened by a certain person. Cross-questioning failed to shake their evidence. The author adjourned the enquiry until the following day, then had the native witnesses mustered outside the boiler-house, and brought in one by one. Each was asked if he actually saw the valve opened, and all replied in the affirmative. They were then asked what work they were doing at the time of the accident, and instructed to place themselves where they were working when they saw the valve opened. Each one of those natives placed himself in a natural working position, but in every instance where a range of boilers in brick setting prevented him from seeing anywhere within several yards of the valve. This is only one of many instances in which the author's experience proves the utter unreliability of native evidence provided that the witnesses have had time and opportunity to hold a previous unofficial enquiry of their own. They swear to their joint verdict, and not to their individual personal knowledge. Mr. Whittome mentions a case where the machinery at a reduction works was placed in charge of the reduction officer, instead of the engineer. A parallel case is that where all underground machinery is placed in charge of the underground manager, and the engineer, though responsible by law, is allowed no

*Reply to discussion on paper read before the South African Institution of Engineers

say regarding it. Such cases are most unfair to the engineer, who cannot afford to quarrel with his bread and butter. Of several such cases the author recalls one where this procedure nearly led to a very large mill being short of rock, and the situation was only saved by the engineer being called on to work night and day to make good neglect which had been continued over an extended period of amateur supervision. However, it is one thing to know these facts, and another to know them officially. Official action can only be taken on official information, and that, usually, is not forthcoming, because those who can give it do not wish to make trouble for themselves and lose their positions. As previously stated, inspectors of machinery make no general inspections, and breaches of regulations 179 and 180 would not be known to them unless they were called on to investigate an accident in connection with winches of which natives had been in charge. These and other cases quoted by Mr. Whittome are covered by a remark of the Government Mining Engineer in the first number of "The Reef," where he states—"It is almost as difficult to make people observe the Mining Regulations against their will as it is to make them honest by Act of Parliament." The author agrees that simplification of the regulations is much to be desired, but such work can only be done by persons who are unfamiliar with them, and who bring open minds to bear on the subject. Those who know the regulations by heart will fail to see many possible simplifications, and will find it impossible to get away from the working with which they are familiar. They will be faced with the same difficulty which besets the engineer on a mine when he tries to locate dangerous places. The result will be a revision of the existing regulations, instead of new, consolidated regulations embodying the desirable features and substance of those now in force, but in condensed form. Mr. Wallace asks for a few remarks descriptive of accidents. Well! Accidents are usually gruesome performances, and the interest is usually centred in the enquiry. The difficulty in obtaining reliable evidence from natives has been instanced in the reply to Mr. Whittome. In reply to Mr. Laschinger. In England some large manufacturers appoint and pay an inspector for their own works. His duties are to see that fences, etc., are not only installed, but are also maintained in efficient repair, and to report to the management if he finds them out of order. He prevents accidents, and so avoids prosecutions under the Factory Act, but has no executive authority. There is much to be said in favour of Mr. Laschinger's suggestion. Safety engineers could be appointed by the Government, and relieve the resident engineer of responsibility; or they might be employed by the mines or the Safety First Committee, and carry no responsibility. Probably the best plan would be for the appointments to be from the mines, with duties to report to head office. As Mr. Laschinger justly says, the resident engineer's time is taken up in seeing that the wheels turn round. Even if he had time personally to inspect every detail, the engineer would probably overlook many points of danger, because he passes them every day and is too familiar with them. Such dangers would catch the eyes of a safety engineer, who is not so well acquainted with that particular plant, and whose mind, being free from all other responsibilities, could be concentrated on a search for possible dangers. The appointment of safety engineers would entail expenditure, but when the aggregate cost of preventable accidents exceeds the saving effected by dispensing with safety engineers, the economic limit has been exceeded. On page 64 of the Government Mining Engineer's report will be found the following regarding shift bosses—"This underground official, once hardly recognised, has become a very important item in our underground supervision, and on him the safety of underground working largely depends." Regulation 161 makes it quite clear that the shift boss shall only be allotted such a measure of work as he can carry out with efficiency. While the engineer is responsible by law for compliance with the machinery regulations affecting the safety of persons, no general action has been taken to provide him with such special assistance as the shift boss renders to the mine overseer.

THE SAFETY FIRST COMMITTEE.

The sincere thanks of all who work on mines is due to the Safety First Committee, whose endeavours have resulted in an appreciable reduction in the number of accidents. According to a published statement of the Government Mining Engineer, made at a recent distribution of prizes in connection with the Rand Mutual Safety Competition, the saving amounts to one hundred lives per year. What was formerly regarded as the irreducible minimum has been proved to be a false standard, and there can be no doubt whatever that further reductions can be made. The periodical inspection of machinery and its fences, etc., by independent persons who are not on the mine staff, but who are specialists with respect to machinery, specialise on the work, and have no other duties to divert their attention, would materially assist in minimising risks. Such appointments would largely bring local conditions into line with the procedure in Europe, and would remove the reproach made by the Government Mining Engineer, at the prize distribution referred to above, when he said—"The accident rate on the Rand was still about double that of first-class European countries. They were now where England was forty years ago." It would be a first step towards a Factory Act, which is badly needed. The industries of the Union have reached a stage of development when the most perfect system for preventing accidents should be instituted if casualties and loss of life are to be reduced to a minimum. The Government Mining Engineer has suggested that more should be done by means of regulations initiated by the mines themselves rather than by regulations formulated by the Government. The author is of opinion that this suggestion might well be put into effect by the appointment of safety engineers, whose duties would be to see that the existing regulations are complied with; and more regulations could afterwards be initiated by the mines if such proved to be necessary and as experience dictated. Complaints of a puzzling superabundance of regulations are frequent, and close inspections would probably render additions unnecessary.

TECHNICAL ASSESSORS.

One phase which might have been expected to appeal to all who spoke to the paper has not been touched on, but, with permission, the author would like to refer to it. The appointment of technical assessors to sit with the magistrates when trying technical cases would largely conduce to the prevention of accidents. A mining engineer in the case of mining accidents, and a mechanical engineer in machinery accidents, after the manner of nautical assessors in Admiralty Courts. A knowledge that the presiding magistrate was being technically advised, and, in consequence, better understood the cases presented to him, could not fail largely to hearten the inspectors. They would then have a fighting chance of securing convictions for breaches of the regulations, even if the public prosecutor, for want of technical experience, was unable to present the case lucidly. Having acted as assessor, the author realises the extent to which a technical assessor can help a magistrate who is not a technical man. The cost would not be great, because cases would be concluded in less time, and the salary of the assessor would be largely balanced by the saving of the time of the magistrate. The author does not claim to have even approached the last word on this subject. In the paper he has endeavoured to exhibit facts, and this reply to discussion to answer comments on the various questions or criticisms which have been put forward by those who have been kind enough to join in the discussion. In conclusion, he would like again to point out how meagre the financial aspect of machinery accidents, and that the total cost is, as suggested by the President, probably nearly double the figure arrived at in the paper.

Copper and South Africa.

The Copper boom has called attention to the excellent prospects of South African producers, notably, Messina. The Rhodesian copper mining group has also come to life, on American purchases effected through Paris, in view of the potentialities more especially of the Central African mines. The Tanganyika output is going up by leaps and bounds, the production for April having been 2,238 tons, as compared with 1,344 tons for March, while the costs of production are understood to have been considerably reduced. At the present rate it will not be very long ere these properties reach their goal of an output of 40,000 tons of copper per annum. The Falcon Mines, making hay while the sun shines, is rapidly reducing its floating debt from its profits on its production of copper. The Bwana M'Kubwa, whose shares were practically worthless a little time ago, has resumed concentration of its higher-grade copper ore, and the market is talking favourably of the prospects of the shares, which are of the face value of 10s. At the same time the company has a long way to go yet before it can be said to have definitely turned the corner. Upon the whole, it is evident that intending investors in Copper Mines can find all they want in the British Empire; but that, at the same time, they should confine their attention to the properties where the ore can be worked at a comparatively cheap rate, as it is obvious that copper will not always be fetching over £100 per ton.

Company Meetings.

RAND MINES.

The twenty-first ordinary meeting of shareholders in the Rand Mines, Ltd., was held on June 21 in the board-room, Corner House, there being present Messrs. E. A. Wallers (chairman), H. C. Boyd, E. Chappell, F. C. Dumat, S. Evans, G. Sonn, W. Dalrymple, C. Distel, H. A. Rogers, E. J. Renaud, J. Jourdan, F. Raleigh, F. H. Barry, S. C. Steil, H. A. Read. There were represented 284,678 shares out of the total issue of 2,125,995 of 5s. shares.

THE CHAIRMAN'S SPEECH.

The Chairman said:—Gentlemen,—As is our custom, we will first consider the essential features of the financial results obtained by the company during last year. The profits amounted to £886,355, a decrease compared with the previous year of £279,895. This decrease is chiefly due to the reduction in dividends received on shareholdings, which amounted to £868,539, compared with £1,131,526 in 1914. Smaller dividends were declared by the Crown Mines, Limited, Ferreira Deep, Limited, Nourse Mines, Limited, Robinson Gold Mining Company, Limited, Rose Deep, Limited, and the Village Main Reef Gold Mining Company, Limited, in addition to which there were no bonus distributions such as were made by the Robinson and Ferreira companies in 1914, which swelled the receipts for that year. The most important reduction is, of course, in the dividends on our large holding of Crown Mines shares, which amounted to 65 per cent. compared with 85 per cent. in 1914. Increased receipts were obtained from the City Deep, which declared 10 per cent. more than during 1914, Geldenhuis Deep—1½ per cent. more—Modderfontein B—an increase of 12½ per cent. —and New Modderfontein—an increase of 2½ per cent. Our revenues from reservoirs, interest and exchange, etc., showed a net decrease of £7,256, chiefly accounted for by the falling off in revenue from the reservoirs, there having been a reduction in the demand for water during the year. Two dividends of 80 per cent. each, absorbing together £850,398 were declared, and after allowing for £54,805 invested in property and shares during the year, we carry forward unappropriated £320,289, compared with £339,103 brought forward from 1914. The balance carried forward represents the net cash position of the company on 1st January last. The total distributions that have been made to shareholders of this company now amount to £12,141,745. Administration costs, taxes, depreciation, etc., at £40,857, are practically the same as last year.

As I have just indicated, the net amount invested for the year was £51,805—of which £5,210 represents the sum spent in acquiring and maintaining interests other than shares, less depreciation and sales of property, whilst the balance of £49,595 is the amount spent on purchases of the shares detailed in the directors' report, less the book value of shares sold. In completing this brief examination of your balance sheet, I would draw your attention to the fact that we have acquired a half share in 862 mining claims on the Farm "Vogelstrusbult" in the far East Rand District. This farm lies to the south of Daggafontein, where, as you know, active development operations have been restarted just lately by the reconstructed Daggafontein Mines, Ltd., in which, I may add, we have also acquired a substantial interest since the beginning of this year. During last year we also purchased a modest shareholding in the Geduld Proprietary Mines, Limited, and the Modderfontein Deep Levels, Limited, at prices which to-day show a satisfactory profit. Your entire share assets now stand in the books at £4,091,345, but as you are well aware they represent a very much larger figure at to-day's market prices.

Operations of the Companies.

Reviewing in bulk the operations of the companies of the Central Mining-Rand Mines Group for the past year, I find that the tonnage milled was 9,183,910, or 648,280 tons more than in 1914. The total gold recovered was valued at £13,427,574, an increase of £686,077. Working costs were, however, 18s. 1d. per ton milled, an increase of 4.7d. per ton, whilst the working profits were £5,122,658, a decrease of £69,365, the working profit having fallen 1s. 0.1d. per ton. As regards the work of the companies individually, I desire particularly to draw attention to the fact that in issuing the account of the proceedings of this meeting we shall attach thereto the full technical reports and the statements made by the chairmen of the respective companies at the annual meetings recently held. You will thus have complete information of every company of our group, and I shall, therefore, be brief in my remarks.

The Durban Roodepoort Deep profit of £52,051 was a little below the year before. However, the dividends were the same as for 1914, viz., 7½ per cent., and the company has been able to strengthen somewhat its cash position.

The Bantjes had a bad year, making a very small profit. Recent discoveries of payable leader in this mine, on which development is now being pushed rapidly, will, I hope, lead to improved results, though it will be some time before the more encouraging development values are reflected in the profits. No dividends were declared during last year.

The Crown Mines.

The Crown Mines is a company in which, as you know, we hold a very large interest and its profit results and dividend distributions have in turn a very distinct effect on your dividend income. I shall, therefore, deal in rather more detail with its affairs, although I would still refer you to the very thorough review given by the chairman at the annual meeting last week, which will be in your possession.

The mine treated a record tonnage during 1915, but owing to additional expenditure due largely to the war and partly to excess development there was a decrease in the amount of dividends declared of £188,021, as compared with 1914. Taking advantage of the good native labour supply, the company is pushing ahead with development as rapidly as possible, and although this adds to working expenditure, you will agree that it is a sound policy and one from which shareholders will derive great benefit later on. As a general rule, no company on the Rand can do too much development. Of the tonnage developed in 1915, 81 per cent., or 2,380,000 tons, having an average value of 6.2 dwts., was payable, and 19 per cent., or 544,000 tons, having an average value of 2.6 dwts., was unpayable. These are very satisfactory figures and indicate a very encouraging percentage of payability. What I feel, however, is a still more desirable feature of the recent development work is the improvement in value in depth of the ore which is being exposed in the western section, especially between the 13th and 16th levels in the old Langlaagte Deep ground. There, below the 13th level, the percentage of payability is higher and the ore exposed is better in value than is the case in the ground above the 13th level. The current ore reserves, just under ten million tons, remain in quantity practically the same as the previous year, but in quality there is an improvement of ¼ dwt. over the whole reserve.

At the annual meeting last week a report was submitted in which Mr. Warriner, the consulting engineer, indicated the plan which it is proposed to follow in opening up and working the whole of the property up to the southern boundary. The method proposed will, it is believed, enable the company to work their ground in a more efficient and more economical manner than would be the case were they to rely on incline shafts.

The Current Year.

As regards the results obtained since the beginning of the current year the profits have been disappointing, due largely to the substitution of hand stoping for machines towards the end of last year when natives were plentiful. It had been expected that the change would have resulted in such an improvement in the grade as would more than cover any extra working expense or any shortage in the tonnage. Unfortunately, that has not been the case. The improvement in the grade was more than counterbalanced by a heavy addition to the costs and a considerable loss of tonnage. The former method of working is now being re-established, but it is a slow process as it takes time to train natives, and experienced machine stopers are very scarce at the moment. It is estimated that the company's mining ground north of the South Rand dyke still has a life of 12 years after allowing for unpayable zones. The unworked section south of the dyke contains 1,278 claims, or an appreciably greater area than that just referred to north of the dyke, but its life will, of course, depend on the percentage of payability of the ore met with during development. Judging, however, by the experience of the neighbouring property, the Robinson Deep, which is developing ground south of the dyke, the Crown Mines has every reason to expect encouraging results from its southern ground. At the meeting on Friday, the chairman pointed out that the company's recent troubles were largely of a transitory character and surmountable. The costs would, no doubt, continue high while the war lasted, but afterwards they hoped to be able to work as economically and as efficiently as in the past. Finally, I would say that the general outlook of the mine has improved in the course of recent months, and that would have been in evidence in the monthly profits had it not been for the extra cost of hand stoping operations and the

general dislocation and additional expenditure caused by the war—the full effect of which is felt by a company like this that has not that elasticity of grade possessed by higher grade mines, where richer rock can be milled to offset temporary additional expenditure.

The Robinson Company, as you are aware, is approaching the end of its life. Last year the profit was £490,452. The life of the mine is probably a little over two years, and a rapid reduction in monthly profits as the mine nears its end must be anticipated. The dividend declared amounted to 14 per cent.

The Ferreira Deep earned £465,788 profit. Considerable trouble has been experienced in the mine owing to disturbances of ground in the mine, and the profits were lower for 1914. Dividends amounted to 42½ per cent.

The Village Deep profits were normal, amounting to £295,828. Development disclosures in the lower level were on the whole satisfactory. The dividends were the same as for 1914, viz.: 21¼ per cent.

The Village Main Reef profit was £170,175, a considerable reduction, due to the disorganisation caused by the very serious falls of ground that, as you are aware, took place last year in the mine. At one time the reduced scale of operations led to considerable monthly losses, but the mine is gradually returning to more normal conditions. The estimated life is short. A dividend of 20 per cent. was declared for the first half of last year.

The City Deep shows a marked improvement, the profit of £615,422 being a record and some £216,646 higher than for 1914. The development position is excellent and certain additions to the plant are now in hand, and it is hoped will be ready about the end of this year. Improved profits have enabled the company to declare dividends of 33⅓ per cent. for 1915, compared with 23⅓ for 1914.

The Nourse Mines show reduced profits, viz., £138,900 against £174,246 the year before. The development in this mine throughout the year has been disappointing, and its natural difficulties as regards working conditions, which have always been present, do not diminish. Dividends distributed amount to 10 per cent.

The Geldenhuis Deep had a normal year, showing £128,600 profit—practically the same as for 1914. The dividends were 20 per cent.

The Rose Deep also yielded average results, the profit being £278,303. Development indicates on the whole a slightly lower grade, but this, we hope, will be eventually counterbalanced by continued large scale operations and lower costs when times are again normal. Dividends distributed were 32½ per cent.

New Modder Record.

The New Modderfontein had a record year—the profits for twelve months to 31st December last being £701,250, compared with £642,473 for 1914. The increase of plant has been delayed by the war and the consequent difficulty in obtaining engineering supplies. The mine is in excellent condition and as soon as it is possible to operate the new plant appreciably increased profits should be available for distribution. Dividends for the twelve months were 32½ per cent., but the cash surplus carried forward was increased considerably in anticipation of the expenditure required for the new plant.

The Modderfontein B also had a record year, the profits being £629,916, compared with £446,340 for 1914. A further small extension of plant will very soon increase the monthly tonnage to about 48,000 tons. Development continues to disclose good values and the general position of the mine is quite sound. Dividends distributed for the year were 67½ per cent. compared with 55 per cent. in 1914.

The results from these companies since the beginning of the current year call for little additional comment—the Crown Mines operations I have already dealt with. The Nourse Mines continue to have a difficult time with poor development. The Geldenhuis Deep looks like having an even better year than last, while the Rose Deep and Village Deep results are normal. The Ferreira Deep is earning good profits and at the same time meeting and overcoming troublesome times with the movements of strata that occur from time to time. The New Modderfontein, Modderfontein B. and the City Deep mines are thoroughly well maintaining this year the very excellent results they achieved last year.

I will now give you the estimated ore reserve position of these companies to which I have referred—excepting only the figures of the Robinson gold mining company.

Ore Reserves at December 31, 9115

Company.	Including shaft and stope safety pillars, Tons.	Estimated value over mining width, dwt.
Modder B.	2,790,740	8.75
*New Modderfontein	6,010,800	8.15
Rose Deep	3,605,390	5.2
Geldenhuis Deep ...	1,826,800	6.1
*Nourse Mines	2,952,400	5.7
City Deep	2,976,800	9.5
Village Main Reef .	635,050	7.1
Village Deep	2,631,600	6.6
†Ferreira Deep	1,854,100	8.3
Crown Mines	9,938,000	6.25
Bantjes Con.	648,000	6.1
Durban-Roodl. Deep	1,290,000	6.5
Total	37,159,680	

*Ore reserves at 30th June, 1915.
†Ore reserves at 30th September, 1915.

The above excludes the ore reserves of the Robinson Gold Mining Company, Ltd., viz.: 983,300 tons of undetermined value.

Assuming that these values are on the whole obtained when the rock is stoped and milled the cash value of these ore reserves would be approximately £54626,000.

Native Employes.

Last year there was a steady increase in the number of native employes available for work on the mines of the Witwatersrand. At the end of December, 1914, the gold mines of this district employed 164,650 natives, whereas at the end of December, 1915, this number had risen to 209,438 natives, a figure slightly in excess of the largest number previously employed, viz., 207,733 in March, 1913. So far as our group is concerned, we had at the end of 1914 49,482 natives, whereas at the end of last year this number had increased to 65,756 natives. At the end of February last the number had further increased to 67,824, but since that date a slight reduction in the numbers has taken place. There is little doubt that whilst the more plentiful supply of labour may be attributed partly to the continued illness of the diamond industry and to drought, yet the natives, particularly in British South Africa, are rapidly recognising the continually improved conditions of employment offered, and that they are well housed, fed and cared for. I feel therefore, that the native labour position may be regarded as in a very satisfactory state.

Health Conditions.

Persistent attention has been given to sanitary and general health conditions in the compounds, and various improvements have been effected. The mortality rate from disease, 14·71 per 1,000, is not quite so good as the figure for 1914, but the increase is due to pneumonia and meningitis, all other diseases showing decreases. It is, however, nearly three per 1,000 less than that of all other mines in the Transvaal. The native accident rate was 3·8 per 1,000, a small increase compared with 1914, when it was 3·5 per 1,000. I am in hopes that this figure will be reduced. Whilst on this subject I would add that it is a matter for congratulation that the "safety first" movement inaugurated by the Rand Mutual Assurance Company, Ltd., some two years ago has attracted, as it should, much interest. I know that excellent work has been done in educating the workers and inculcating a sense of personal responsibility not only in them, but also in all those who have anything to do with the running of the mines. The death-rate from accidents on the mines of these fields for the year 1915 was a record, being 3·19 per 1,000. I feel convinced that we shall show still further improvement, and that the "safety first" movement will find continued scope for its activities.

Metallurgical practice has shown but little variation during the year. Cyanide, zinc, etc., have very heavily increased in cost, of which a portion at least has been recovered by economy in consumption.

The supply of electric and air power was maintained satisfactorily throughout the year by the Rand Mines Power Supply Company. The average number of units of compressed air per drill shift was 128, compared with 115 units in 1914. This increase is due chiefly to freer use of compressed air for ventilation but probably also to the less efficient use of air in drilling owing to so many of our best miners being away on active service.

Rock Drills.

The average cost of machine maintenance was the same as for 1914. A saving of some £15,000 was effected, however, in the cost of rock drill steel and sharpening costs. In view of the increased cost of steel this is very satisfactory, and speaks well for the co-operation existing between our mine resident engineers and Mr. E. G. Izod, our consulting electrical and mechanical engineer, and his staff.

Our engineers have assisted in organising a body of munition workers for service overseas. We have had excellent reports of the work of these men. Economies have been effected in working up scrapped material, thus reducing the demand for imported supplies.

Important economies have been made in the use of lower-grade explosives in place of the higher grades, with a consequent appreciable reduction in the consumption of glycerine, which to-day is a matter of national importance. Experiments with a view to further economies are still proceeding, and it seems clear that the more extended use of lower-grade explosives, at least in stoping operations, will be a permanent economy for the industry.

Reservoirs.

The satisfactory rains which fell during the last wet season greatly improved the general water position, and our two main reservoirs at Boksburg and Boyoens were practically full at the close of the year. Naturally, the conservation of water by our customers during the period of plenty has meant a reduction in the quantity of water supplied to them, and a consequent fall in our water revenue. The Rand Water Board, having obtained the necessary authority, is proceeding with the development of a modified scheme for the drawing of water from the Vaal River. The expenditure involved is about three-quarters of a million, and it is anticipated that water will be available some time in 1919.

Legislation.

An amendment of the laws relating to miners' phthisis has recently been before Parliament. Changes of great importance have been made not only in the increased scale of compensation awarded to sui-

ferers and their dependents, but also in the administration of the law. Whilst it is true that the amendment regarding the amount of compensation to be paid will impose further financial burdens upon the mining industry, yet I feel that the alterations and additions to the law, if put into effect with care and discretion, will undoubtedly prove a great step forward towards the end we all most earnestly wish to attain, viz., the practical elimination of this disease. A Bill to help towards the more effective and rapid development of untouched areas in the far East Rand reached a certain stage before the House of Assembly, but most unfortunately was not proceeded with to the end. The continued delay in the further opening up of this section of the fields is bound to be a most serious matter for all the inhabitants of the Union.

Active Service.

The splendid patriotism of the staff and employes as a whole in our group of mines needs no testimony from me; it speaks for itself. If we had allowed all to go on active service who desired to go, then we should have been obliged practically to cease working our mines.

As it is, nearly 1,400 men from our group are serving and I deeply regret to record that the following men have lost their lives:—Captain Percy Newton, Lieut. R. Gillett, Lance-Corpl. D. G. Hedding, Lance-Corpl. S. Wild, Trumpeter S. H. Curtis, Pte. W. C. Goodwill, Pte. H. Atkinson, Pte. W. C. Mannel, Pte. H. W. Matthews, Pte. R. F. Dodd, Pte. W. White, Pte. H. M. Lowe, Pte. A. Pero, Pte. G. C. W. Chevalier, Pte. A. Muir, Pte. M. J. Fleming, Pte. J. H. Cowle, Pte. B. R. L. Verbeek, Pte. H. Chittenden, Pte. J. P. Marsh, and Pte. R. R. Rex. Our sympathies are extended to their relatives. Liberal allowances are being made to dependents, and all employes returning to their work after the war will be reinstated.

The wonderfully generous support to patriotic funds which has been given by the mine employes is a matter I would like to refer to for a moment. The total amount subscribed to the chief funds by the employes of our group alone since the commencement of the war to 30th April last was no less than £65,000. That is a remarkable figure, and is eloquent and practical evidence of the desire of these men to help in any and every direction.

Summary.

In summarising the general effect of the abnormal working conditions upon the activities of this industry it seems to me that the outstanding feature is this—that our mines, because of, and only because of, the fact that behind our activities is the British Navy, have continued to pour an uninterrupted stream of gold into the coffers of the Bank of England, and London remains the free gold market of the world. It is true that these results have been achieved by means of a vastly increased working expenditure, and I propose to put a few facts before you indicating the manner in which this matter affected the profit results of the companies in which you are vitally concerned. We have continued, in conjunction with other mining groups, the special arrangements necessary to maintain adequate quantities of those essential mining supplies which are not produced in this country, and continue also to be indebted for the valuable assistance in this work given by a strong committee in London, to which our London secretary, Mr. Andrew Moir acts in that capacity. These particular supplies to which I refer are cyanide, zinc, and mercury only; the other countless requirements of the industry have been most satisfactorily met by the local merchants and through the usual channels.

The very large increase in the cost of stores and materials is, of course, due in a great measure to the disorganisation of the freight market and the fabulous rates now ruling in that connection. Careful estimates show that the increase in working costs due to higher cost of stores and materials amounts to 9d. per ton, or in other words, on the tonnage milled by the mines of our group, a total additional cost of approximately £345,000 for 12 months. In addition to this, we have to remember that the necessity of having largely increased reserve supplies to meet emergencies has led to the gradual accumulation by our mines of stocks much in excess of those carried in normal times. Prior to the war our companies held stocks to the value of £163,000, whilst at the end of last year our stores had increased to a value of £457,000, being an increase in cash locked up of £294,000. There have, however, been certain compensations in these conditions which are gratifying. The difficulties with which we have been faced and the general high cost of all necessary mining supplies have stimulated our managements to more rigid economies in the consumption of some stores, and no effort has been spared on their part to counterbalance as far as they can the increase in costs. They have been very successful in many directions, and I am sure they will see to it that we hold fast to these economies when normal times return.

Abnormal Expenditure.

Another factor in our increased expenditure is that the cost of realising our gold is very much greater owing to the enhanced freight and insurance charges. It now costs us nearly 1s. per fine ounce more than prior to the war; or, in other words, an additional cost for 12 months for our group of mines of £153,000.

Further, we have to meet a temporary increase in taxation. The Government imposed last year a special war levy of £500,000 on the profits of the industry, in addition to the profits tax payable under the Mining Taxation Act, and I regret to say have found it necessary to reimpose a similar special levy this year. Of the £500,000 imposed last year the companies of our group provide approximately £237,000 or 47½ per cent.

There are other abnormal items in working expenditure which are more difficult to translate into actual cash, but we are safe in estimating that the additions to the working expenditure of the mines in our group and attributable to the war are not less than £800,000 during a period of 12 months.

On the credit side, however, there are these points to be remembered. Some of our companies, as a result of the satisfactory native labour supply, have been able to increase considerably the tonnage milled, and by this means, and in some cases also by the milling of a higher-grade ore, they have more than maintained their profit distribution. Other of our companies, notably the Crown Mines, have unavoidably felt the full effect of the abnormal expenditure that has to be faced, and profit distributions have consequently been appreciably reduced. I have already referred in some detail to the position of this last-named company, and you are aware of the magnitude of your Crown Mines interest.

Having all these facts in mind gentlemen, it is not surprising that our dividend income obtained from our share interests as a whole was considerably reduced in these abnormal times, and that therefore the dividends that this company was in turn able to distribute last year and for the first half of this year suffered a corresponding reduction. It is clear that these abnormal conditions will continue until the war is over, and we are indeed peculiarly fortunate that they are not abnormal to a still greater degree.

Industrial Outlook.

As regards the general industrial outlook after hostilities have ceased, it is impossible to visualise the position at all clearly or to realise its effect upon the cost of production in the industry in which we are concerned. In Europe the return to civil occupation of vast numbers of men and the continuation of heavy taxation are bound to create a position which will require, from all sides, the exercise of the utmost discretion and soundest commonsense in order to arrive at a proper adjustment. With us here the problem, although presenting some points of difficulty, should certainly be capable of much easier solution, provided always that the people of this country, shedding all party political prejudices, definitely realise that the expansion of this industry in other undeveloped areas of these fields, coincident with the expansion and creation of allied and other industries based upon our own raw products, are the essential factors in the solution of our problems—are indeed the only means open to us. And now, gentlemen, a word as to our large organisation and staff as a whole. You will realise that the period we have been reviewing has been one of peculiar difficulty, with different and unusual sets of circumstances arising from time to time, which have been met and handled with the greatest loyalty and efficiency. It would be invidious for me to mention any names without mentioning a very great number, and therefore I content myself with placing on record our very keen appreciation of their work. The departure for Europe last year of Mr. Raymond Schumacher on account of indifferent health was viewed by his colleagues with great regret. He had been chairman of this company for six years and rendered valuable service. We are happy to think that he remains a director. I now beg to move the adoption of the reports and accounts for the year ended the 31st December, 1915.

Influence of Golden Bullets.

Mr. E. J. Renand said: After the thorough review of the position of affairs which the chairman has just made, it appears difficult for me to add to his remarks. I think it is very gratifying to see that in the trying year that 1915 has been, the Rand Mines, Limited, have been able to distribute 160 per cent. in dividends and at the same time carry forward a balance which was only a little less than £19,000 below the balance carried forward at the end of the year 1914, a year which was only affected by the war to the extent of five months instead of a full year as was the case in 1915. There has been a substantial progress in the tonnage milled by the companies of the group, and the value of the gold recovered has shown a marked advance which has enabled the said group to help the British Empire to the extent of £686,077 more gold than in the previous year, a very commendable achievement in a period in which the golden bullet may have a great influence on the issue of the war. I fully agree with the chairman when he expresses the opinion that no mine on the Rand can do too much development. This facilitates to a large extent the maintenance of more regular results and gives more security about the future of every individual mine.

Mr. R. W. Schumacher and Sir S. Neumann were re-elected to the board, and the auditors were reappointed.

CROWN MINES.

The annual meeting of shareholders of the Crown Mines, Ltd., was held on June 16 at 11 o'clock in the board-room, Corner House, Mr. S. Evans presiding. There were also present Messrs. E. A. Wallers, H. A. Rogers, F. Raleigh, H. C. Boyd, W. Dalrymple, A. G. Gill, F. H. Barry, S. C. Stiel, H. L. Mascall, J. L. Jourdan, E. Renaud, A. P. Richter, F. C. Dumat, O. A. Gerber, C. Distel, R. C. Warriner (consulting engineer), and H. A. Read (financial manager, Rand Mines), representing 994,103 shares out of an issue of 1,880,212.

The Chairman said:—The reports and accounts which are in your possession deal very fully with the work accomplished during 1915. You will observe that compared with 1914 there is an increase of 15,602 in the feet developed, 257,763 in the tons mined, 210,000 in the tons milled, £188,655 in the gross revenue, £233,731 in the working costs, whilst there is a decrease of £45,076 in the working profit, and £188,021 in the amount of the dividends declared. The working

costs have risen by 7d. per ton and the grade is 4d. per ton lower than in 1914 after allowing for the increased gold realisation charges. The working profit for last year amounted to £1,146,522 1s., to which has to be added revenue from estates, freehold interest and other sundry sources, £24,980 12s. 1d., making a total of £1,171,502 13s. 1d. The dividends paid absorbed £611,068 1s., leaving a balance of £560,063 15s. 1d., which was dealt with as follows:—Government taxes: Union of South Africa, £155,7-1 14s.; English income tax, £799 6s. 1d. equal to £159,584 0s. 1d.; annuity paid to Government in respect of undermining rights, £19,979; redemption of debentures, £5,750; interest on debentures, £43,288 6s. 5d.; capital expenditure, £98,222 1s. 10d.; miners' phthisis: insurance and compensation funds, £37,377 2s. 5d.; less insurance fund charged to working costs, £14,921 13s. 7d., equal to £22,455 8s. 10d.; contributions to war funds and donations, £4,686 7s. 10d., total, £433,965 5s. There remained £126,098 10s. 1d., which is accounted for by an increase in the cash and cash assets which stood at—December 31st, 1914, £47,453 2s.; December 31st, 1915, £173,951 12s. 1d.

The item of £173,951 12s. 1d., cash and cash assets, at December 31st, 1915, is made up as follows:—Shares and interest in co-operative concerns, £26,673; stores, materials, etc., £140,692 6s. 9d.; sundry debtors and payments in advance, £47,070 5s. 1d.; total, £214,435 11s. 10d.; less—net cash liabilities (excluding debentures outstanding £829,200), £40,483 19s. 9d.; making £173,951 12s. 1d.

Profits and Costs.

Few people realise the extraordinary extent to which the profits of the gold mining industry have been adversely affected in recent years through additions to working costs. Last year our distributable profit was diminished by the following items of expenditure which are directly attributable to the war:—Increased price of stores, at least £60,000; war bonuses and active service allowances, £10,000; contribution to special war levy, £52,700; increased charges on the realisation of gold, £45,382, making a total of £168,082, equal to 1s. 4.15d. per ton milled. As I have already mentioned, our total gross profits actually amounted to £1,171,533, so had there been no war we could reasonably have expected a total of £1,339,615, a figure higher than that of any previous year, excepting 1913, when the working profit amounted to £1,442,473. I may mention that the total annual average working profits of the constituent companies and the amalgamated company were—Five years ended December 31, 1908, £1,032,000; five years ended December 31st, 1914, £1,280,336. So that under normal pre-war conditions the working profits for last year would have compared favourably with those of previous years.

What I have said, however, does not by any means exhaust the subject. As I have already stated, costs last year show an increase of £168,082 as compared with the first half of 1914. During that period, however, there was something like 2s. 8d. per ton additional costs as compared with 1908 (the year immediately preceding the amalgamation) due to increased native wages, modifications of the Mining Regulations, new legislation regarding working hours, miners' phthisis, etc. The 2s. 8d. per ton on last year's tonnage amounted £332,933, making an aggregate of £501,015.

Native Labour.

But that is not all. During the greater part of the five years ended December 31, 1908, the Rand mining industry had an adequate supply of very efficient unskilled labour. Since the inception of the Crown Mines up to the middle of last year our unskilled labour force has been inadequate and often very inefficient. In my speech last year I showed that from July 1st, 1909, to December 31st 1914, the difference between the ore milled and the capacity of our plant totalled 2,789,276 tons, and that had we been able to use, say, 80 per cent. of our spare capacity during that period we should have added £1,524,000 to our profits after making full allowance for the fall in the grade of the ore mined. Such an addition to our profits would have rendered our debenture issue and overdraft unnecessary and we should have not have had to meet the following charges last year:—Purchase of debentures, £5,750; interest on debentures, £43,288; total, £129,038, bringing up to £630,053 the total addition to profit which might have taken place in 1915 had there been no war and had the conditions bearing on cost been as favourable since the amalgamation as they were during the five years preceding the amalgamation.

Wrong Impression.

I hope I am not wearying you with these details. I consider that it is necessary that you should clearly understand the position as there is an impression abroad that the troubles of the Crown Mines are confined to the fall in grade. It is true that the grade has been disappointing and that we have encountered unpayable zones in the course of the last two years' development, but the figures I have just quoted show that we should still have been making good profits had the costs and the labour supply been as satisfactory as we had every reason to anticipate in 1908 and 1909. If any shareholder who is sufficiently interested in the matter will take the trouble to look at the chairman's speech at the Crown Deep meeting on April 8th, 1909, he will see that Mr. Reyersbach then anticipated that the amalgamated company's ore reserves would gradually be increased to from six and a half to seven million tons, principally in the western section, with a grade of a little over 6½ dwts.; so that the actual position of the ore reserves does not differ so very much as to values—say, half of a dwt. at most—from what was anticipated, and as to the tonnage exposed, it is much greater. At the end of last year our ore reserves totalled 9,038,000 tons valued at 6.25 dwts., or 84,000 tons less in quantity and .25 dwt. better in grade than at the end of 1914. As you will see from the consulting engineer's report we have been passing through unpayable zones south of the 13th level, notably in the eastern section, and more particularly on the south reef. Of the tonnage developed last year 81 per cent.—2,379,912 tons—was payable, and 18.6 per cent. 543,911 tons—unpayable. The payable ore had an average value of 6.2 dwts. and the unpayable 2.6 dwts. so that it is probable that a certain proportion of the latter will eventually be mined at a profit. I may mention that we mined from the ore reserves in 1915 2,053,499 tons.

Last Year's Development.

A satisfactory point as regards last year's development is the improvement in value in depth of the ore which is being opened up in the western section, more especially in the Langlaagte Deep ground. There, below the 13th level, the percentage of payability is higher and the ore exposed is better in value than is the case in the ground above the 13th level, and a reassuring feature in this connection is the fact that the greater portion of our unworked ground is in the western section.

You will remember that Mr. Webber at the beginning of 1909 estimated that it would take sixteen years to exhaust the payable ore in our ground north of the South Rand dyke. Although we have been working for seven years on a larger scale than he contemplated we consider that the northern section has still a life of about 12 years, after making allowance for the unpayable zones encountered in the course of the last two years' development. We may, however, have to begin to draw ore from the southern area in about seven or eight years' time as the diminished number of stopes north of the Dyke will not suffice to keep our reduction plants fully supplied. That, of course, will mean that we shall continue to work portions of the northern section for a much longer period than 12 years.

South Rand Dyke.

In this connection it may interest you to have the figures of the total yield of this area up to the end of last year. The Crown Reef started milling in April, 1888, and in the 28 years that have elapsed since the results obtained from the area which we own have been:—

	Constituent Companies up to 30 6 09.	Amalgamated Company from 1 7 09 to 31 12 15.	Total.
Tons milled	10,290,837	12,773,724	23,064,161
Value of yield	£19,859,182	£19,017,303	£38,876,485
Dividends paid	£6,653,566	£6,251,705	£12,905,271
Percentage of yield paid in dividends	33.5	32.9	33.2

The Pioneer and the Bonanza are not included.

The weight of fine gold produced by the Crown Mines and its constituent companies from the commencement totalled 312.31 tons. Our production of fine gold last year weighed 23.39 tons, and the weight of the gold produced by all the companies of the Rand last year was 268.89 tons.

The Southern Ground.

As I have said, we may have to commence to draw some ore from the section south of the South Rand Dyke in seven or eight years' time. It is, therefore, necessary to start without delay on the preparatory work so that we are in a position to mine from the southern ground when the number of stope faces north of the Dyke become too few to maintain our monthly output at the maximum figure. Mr. Warriner has prepared a detailed report on the method of opening up and working the whole of the southern ground, which totals about 1,278 unworked claims. Copies of this report are on the table and at your disposal. As the document is largely of a technical character, we are not incurring the expense of posting a copy to each shareholder, but any shareholder who cares to have a copy can get one on applying to the secretary, either here or in London. To carry out the whole of the scheme will involve an appropriation from profits of about £100,000 per annum for a period of about 15 years, or about 9d. per ton on the capacity of our plants. As will be seen from the report, practically all this expenditure is fairly chargeable against working costs, as it provides

for doing in a more efficient and economical manner work that is equivalent to the extension of the incline shafts, the expenditure on which is usually debited to working costs. I hope shareholders will appreciate the fact that the adoption of Mr. Warriner's scheme means in reality a reduction and not an increase in the total expenditure. That is, we shall in the end spend less and make more profit than would be the case were we to follow the usual course and rely on incline shafts for the development of the lower portions of our property. The work on the new circular shaft, No. 14, has been commenced, and we expect to make rapid progress. We are approaching the South Rand Dyke from No. 5 shaft and cross-cutting through it south of No. 7 shaft, and when our next meeting takes place, or perhaps earlier, we shall, I hope, have some definite knowledge as to the value of the reefs in at any rate a section of the southern ground. I may say that our neighbours, the Robinson Deep, are developing south of the dyke, and, judging by their experience, we are justified in expecting encouraging results. Before leaving the question of the exploitation of the southern ground, I should like to mention that the thanks of the shareholders are due to our consulting engineer, Mr. Warriner, for the foresight which he showed in 1910, when he strongly advised the sinking of No. 5 shaft to the plane of the 19th level, or 1,250 feet below the point at which the main reef series was passed through. It is the adoption of that policy that has made it possible for ore from the southern ground to be hauled through No. 5 shaft without any further capital expenditure either on that shaft, the crusher stations or on the surface equipment connecting the shaft with the reduction plants. As far as we can now see that shaft will continue our main haulage way to the surface pretty well up to the end of the life of the mine.

Welfare of Employes.

The safety, health and general welfare of our employes and their families continue to receive our close and constant attention. We had in our employ last year an average of 1,639 Europeans, of whom nearly half were South African born. At the fourth annual ambulance competition held in March last, the Crown Mines' teams under the efficient direction of Mr. Anderson, the company's chief ambulance officer, again secured the two shields, one for surface and one for underground, presented by the Chemical, Metallurgical and Mining Society of South Africa. Our medical officer, Dr. Loeser and his assistant, Dr. Gibson, are indefatigable in their efforts to create conditions which will tend to eliminate disease from amongst our workers. The death rate per thousand per annum from disease among the company's employes last year was, Europeans 7.9, natives and coloured 14.13.

The death rate from disease among our native workers was 21.15 per thousand in 1914, 26.33 in 1915 and 27.36 in 1912. A tentative effort was made last year to inoculate and re-inoculate against enteric fever boys who had never before been on the Witwatersrand, but owing to practical difficulties this had to be abandoned for the time being. As a safeguard against carriers of enteric, all kitchen boys are tested and no new kitchen boys are allowed to be taken on unless they have been proved not to be carriers of enteric.

Improved Conditions.

The improvement in the sanitary conditions, particularly the introduction of the septic tank system in place of buckets in 1913, has materially reduced the incidence of enteric, dysentery and other diarrhoeal diseases. Dr. Orenstein, Superintendent of Sanitation of the Central Mining-Rand Mines group of companies, writes in a report which I have just received that—"water-borne sewage has been extended to all the compounds of the Crown Mines, and it is to this, more than to any other cause, that the improvement in the incidence and mortality of enteric fever and other intestinal diseases can be attributed. Several other causes have undoubtedly contributed to this result, particularly the great reduction in the number of flies brought about by the stimulus given to these efforts. Mr. McKenzie, the compound manager, was the winner of the first prize for measures against fly-breeding offered by the directors of the Rand Mines. In connection with fly reduction, the abolition of mahou-making by the natives in their compound rooms, and the installation of central plants for this purpose, have been of great value, but undoubtedly the most important factor in reducing fly-breeding has been the installation of portable garbage bins in the compounds and quarters on the mine and the provision of incinerators for the destruction of the collected garbage.

Notable Improvement.

"The most notable improvement now being carried out on the Crown Mines is the installation of individual bunks in the compound rooms. You will recall that the first recommendation of Major-General Gorgas was that more space be provided for the individual native. He points out that his object in this recommendation is not so much to provide more air, but to minimise as much as possible close contact between individuals. Individual sleeping bunks have been in use only such a short time that it is impossible at present to estimate their value in preventing disease, but the Modderfontein Deep Levels has its individual sleeping bunks now for over a year, and, in addition to their great popularity with the natives, as test tied to by the compound manager and the general manager of that mine, it is noteworthy that the total number of deaths from pneumonia for 1915 was 6, giving a mortality rate for pneumonia of 3.12 per 1,000 per annum, and the total number of deaths from disease was 13, giving a rate of 6.7 per 1,000 per annum, as against a rate of 6.5 and 14.6 respectively for the Central Mining-Rand Mines Group."

During the year there have been extreme fluctuations in our native labour force. In January, we had in our employ 12,627 Kaffirs, increasing to 14,550 in April, going down to 13,783 in July, and increasing again up to 18,129 in November and 18,458 in December. Such fluctuations are not conducive to efficiency, particularly as the November and December figures contained a large proportion of raw natives. We have taken advantage of the plentiful supply of native labour to push ahead development. The footage developed for the 10 months ended May, this year, has totalled 49,362 feet, as compared with 32,833 and 21,712 feet for the corresponding periods of 1914-15 and 1913-14. The policy which we are pursuing means a considerable temporary increase in our working costs, but we shall benefit from this later on.

Experiment in Stoping.

We have also taken advantage of the abundant supply of natives to carry on an experiment in order to ascertain if it is possible to improve the grade and enhance the profits by substituting hand for machine stoping, thus considerably narrowing the stoping widths by leaving some of the poorer bands of reef in the hanging wall and diminishing the quantity of external waste mined. The results have been distinctly disappointing, but, as the experiment was only commenced about the middle of October the profits of the year under review were adversely affected by it in November and December only. By March this year the proportion of rock broken by hand had been increased to 56.3 per cent. of the total tonnage steped, as compared with 14.7 per cent. in the first quarter of 1915; the widths had been substantially narrowed and the average yield per ton increased by .5 dwt. As, however, it was found impossible to stope as large a fathomage, even when working 37 additional faces, there was a fall in the tonnage milled per month; the total cost of production was greater, and the total yield less by the amount of recoverable gold contained in the hanging bands left behind and in the larger area previously stoped. Consequently, the net result has been a considerable reduction in the profits earned. The management is now reverting to the former method of working; but it is a slow process, as experienced machine miners are very scarce and a large proportion of the natives require to be trained before they become proficient in handling machines. At the best of times changes from hand to machine stoping involve disorganisation, low efficiency, and additional expense for some months and the situation is aggravated at present owing to the fact that a considerable number of machine miners have joined the Forces.

Employes on Active Service.

The directors and the management fully realise the vital importance of doing everything that can be done to assist the Empire in the war. Wherever possible our employes have been granted permission to enlist, and altogether about four hundred men, including Italians and Portuguese, have left the mine for active service on the side of the Allies. The departure for the front of such a number, including some of our most experienced men, has been a serious handicap to the company, and is no doubt responsible for some of the increase that has taken place in our costs, particularly in the last six or seven months. Of the 40 occupants of the staff quarters at the outbreak of hostilities, 31 have joined the Forces, and the directors and the management cordially appreciate the action of those members of the staff and other employes who wished to enlist, but who consented to remain at their posts to enable the mine to continue operations. If all who were anxious to join the Forces had been granted permission we should have had to close down entirely. It is with deep regret that we have to record that four of our men, H. M. Lowe, B. A. Pero, W. White and G. R. Thompson have been killed in action, and three, L. W. Creighton, J. D. Hey, and G. W. Lewis, have been seriously wounded. It is, I am sure, your wish to join with the directors in extending our sincerest sympathies to the bereaved families. We hope that the wounded will speedily recover and be able to resume their duties.

This Year's Results.

Before sitting down I wish to refer to the results so far obtained this year. As you will no doubt have seen we have declared a dividend of 25 per cent. for the half-year ending the 30th of this month. Under the circumstances the directors felt that they would not be justified in distributing a larger amount. Comparing the results of the five months that have elapsed of the present year with those of the corresponding period of last year, the figures are:—

	Monthly Averages, five months ended May 31. 1915.	1916.
Footage developed	3,405	5,199
Tons milled	204,400	186,400
Value of yield:		
Total	£260,373	£247,654
per ton milled	25/6	26/7
Working costs:—		
Total	£160,316	£178,845
Per ton milled	15/8	19/2
Working profit:—		
Total	£100,057	£68,809
Per ton milled	9/10	7/5

It will be noted that notwithstanding an improvement of 1s. 1d. in the grade there is a decrease in the average monthly profit this year of £31,248 caused by:—

(a) A fall of 18,000 in the average tonnage milled, and

(b) An increase of £18,529, or 3s. 6d. per ton, milled in the working costs.

I have already dealt to some extent with the increase in costs. Briefly, the reasons for it are:—The war, directly and indirectly; excess development; the increased cost of hand labour in the stopes where hammers were substituted for machines and the smaller tonnage. The expenditure on development would have had to be incurred sooner or later, and the management considered it advisable to press on the work whilst the necessary native labour was available.

The shortage in tonnage is attributable mainly to:—

The substitution of hand labour for machines in a number of stopes when labour became plentiful at the end of last year and the beginning of this year. No doubt a contributory factor is the decreased efficiency of our labour force, due largely to the fact that some of the most competent of our underground officials and miners have joined the forces and have had to be replaced by less experienced men.

Transitory Tables.

As shareholders will see, our present troubles are largely of a transitory character and are surmountable. The costs may go higher still, and will undoubtedly continue high whilst the war lasts, but when the war is over we have every reason to believe that we shall be able to work as economically and as efficiently as we have ever done, having due regard to the additional expenditure imposed by the increased depth of the workings. On the whole, I believe I am justified in saying that the general outlook of the mine has improved in the course of recent months and that that would have been reflected in the monthly profits had it not been for the extra cost of hand stoping and the dislocation caused by the war, directly and indirectly. I need hardly say that the last six or seven months has been an anxious period for the management, and for all connected with the mine. But we feel confident that we shall gradually overcome the present difficulties and again show good profits. There remains for me to express our sincere acknowledgments of the valuable services rendered to us by Mr. Warriner, consulting engineer; Mr Brett, general manager; Messrs W. J. Pitchford and T. Simpson, joint managers, and other members of the company's staff at the mine and in the head office. I now beg to move that the directors' report, balance sheet and accounts for the year ended the 31st of December, 1915, laid before the meeting, be received and adopted.

The report and accounts were adopted.

The retiring directors, Messrs H. A. Rogers and F. G. C. E. Robellaz, were re-elected.

Messrs. C. L. Andersson and Co. and Howard Pim and Hardy were re-appointed auditors, and the remuneration for the past audit was fixed at 750 guineas each.

VILLAGE DEEP.

The 16th ordinary general meeting of shareholders in the Village Deep Ltd., was held on June 19 in the board-room, Corner House. There were present Messrs. H. C. Boyd, in the chair, S. C. Steil, F. H. Barry, J. H. Ryan, F. C. Dumat, B. Southwell, C. Marx, A. J. Wright, C. Distel, A. P. Richter, J. Munro, M. Honnet, S. M. Nelson, E. A. Wallers, A. G. Gill, W. Dalrymple, and W. H. B. Frank. There were represented 459,875 shares out of the total issue of 1,060,671.

The Chairman said:—Gentlemen,—During the past year, with which the report and accounts before you deal, owing to the weighting up of the stamps and the small extension of the slimes plant we were enabled to crush 622,200 tons, or nearly 22,000 more than in any previous year. Compared with 1914 the recovery increased by 7d. per ton in spite of the increased gold realisation charges equivalent to 4.6d. per ton, and the greater amount of reclamation tonnage milled. Costs rose by 1s. 4d. per ton owing to the greater expenses brought about by the war, the additional expenditure on timbering and rock-walling rendered necessary for the support of the hanging wall at the increased depths, and greater development footage which included nearly four times as much incline shaft sinking as during the previous year. The increased donations to various war relief funds, etc., will, I am sure, meet with your hearty approval. From the net profit of £296,411 two dividends totalling £225,392 were paid, and the taxes—increased to £41,550 owing to the special war levy, which will again have to be borne this year. Expenditure on equipment was but small on balance and the amount carried forward was increased to £106,646, of which £35,415 was cash, stores of the unusually high value of over £52,000 being carried as a precautionary measure.

In spite of considerable exploratory work but little payable south reef was disclosed, but results in the main reef leader were satisfactory; some 334,000 tons averaging 8.3 dwts. per ton were fully developed, and 31,000 tons unpayable, which were virtually all contained in one block some 800 feet west of No. 3 incline between the 18th and 19th levels. In addition, it was estimated that the equivalent of 348,000 tons had been partially developed by foot-wall driving only, requiring further development by crosscut raises before valuation becomes possible. The majority of this tonnage lies east of the shaft and will undoubtedly be payable; of it 67,000 tons have so far been valued this year at 6.6 dwts. per ton and no unpayable has yet been disclosed. Allowing for this, there may be said to be virtually no change in the main reef leader reserves as regards tonnage, and as undoubtedly at the moment of estimating the reserves the faces of some of the larger blocks on this reef were poorer than before or since, it may be said that the fractional decrease in average value is more apparent than real. In the south reef, however, there was proportionately a material decrease both in quantity and value, owing to lack of payable development during the year.

Milling Operations.

During the current year an average of a little over 52,000 tons have been milled monthly. Although costs appear unduly high, especially in the last two months, and will certainly be reduced if possible, they account to a great extent for the present satisfactory recovery, which during April and May was nearly 30s. 6d. per ton, as we have succeeded through the use of hand labour for drilling, and the employment of additional precautions for supporting the hanging wall, in materially reducing the stope widths in depth. Costs have also had to cover increased development and heavy expenditure on underground equipment.

A dividend of 8½ per cent. has just been declared for the current half-year, virtually absorbing the net earnings for the period. Up to the end of last year the only unpayable ore disclosed in the lower levels of the mine was in two blocks below the 16th level—one east of the main incline and one adjoining the dyke shown on the plan attached to the report as coming from the South Deep's ground—and in two, also alongside that dyke, below the 17th and 18th levels respectively. From the current year's work it appears that this unpayable shoot will probably continue to the 21st level, but considering the extent of the property from east to west the area concerned is comparatively small and development values elsewhere, east of the main incline and in the extreme west, have been highly satisfactory.

As you will see from the plan, the main incline shaft is well into the lower mynpacht. At the end of last month it was 22 feet below the 25th station, the excavation work of which is completed, or at a vertical depth of 5,090 feet, while the east and west development inclines were respectively 113 feet and 23 feet below the 22nd level. The reef has lately been intersected in the crosscut from the latter incline on this level and is 15 inches wide with a value of 43 dwts. per ton. The bottom band of the leader has just been cut in a crosscut from the 24th level over the main incline, showing 28.6 dwts. over 13 inches. Although not fully cut, this indicates a satisfactory average value at the lowest point in the mine at which reef is exposed, and is therefore interesting. I am glad to be able to report that the conditions at the great depth attained in the main incline as regards ventilation, etc., are highly satisfactory thanks to the precautions which have been taken. As the manager's report mentions, unremitting attention has continued to be paid to the vitally important matter of maintaining good health conditions generally underground.

Future Lay-Out.

Permission has been obtained to do the development necessary in the interest of the future lay-out of the mine

under Springfield Township, the extension, La Rochelle deproclaimed ground and the bewaarplaatsen and waterright areas to the east, the idea being, of course, that we shall eventually acquire the mining rights thereunder. The Government is not in a position to-day to deal with the extension and deproclaimed ground until the Gold Law is amended, as we had hoped it might have been during the present session of Parliament, but negotiations are proceeding in respect of the remaining areas and will, I trust, be concluded shortly. Our requirements in the way of necessary supplies continue to be adequately provided, though naturally in many cases at rising prices, and the arrangement with the Bank of England for the realisation of our gold works smoothly; we are now permitted to draw 98½ per cent. of the value of all gold deposited.

One hundred and four of our employes are now on active service, the allowances to the dependents of whom come to a little over £1,000 per month. Two, I regret to say, H. W. Matthews and W. T. Manuel, have fallen in the service of their country, and we tender our respectful sympathy to their relatives. Those who remain at their less exacting, but equally important work on the mine continue to contribute to the various war funds, as do virtually all the employes on the gold mines, in a manner which must win our admiration.

We would record our appreciation of the valuable services which Mr. Stuart Martin, our consulting engineer, Mr. J. Whitehouse, our manager, and the staff generally continue to render us. I now beg to move that the directors' report, balance sheet and accounts for the year ended 31st December, 1915, laid before the meeting, be received and adopted.

The motion was adopted.

Messrs. J. H. Ryan and F. G. C. E. Robellaz were re-elected directors, and the auditors were reappointed.

GELDENHUIS DEEP

The annual meeting of the Geldenhuis Deep, Ltd., was held on June 19 in the board-room, Corner House. There were present Messrs. E. A. Wallers (chairman), F. Raleigh, H. Newhouse, A. F. Mullins, M. Honnet, R. M. Connolly, A. P. Ritchie, F. de Ferrieres, A. Sprinz,. S. M. Nelson, B. H. Davis, F. H. Barry and H. S. Steil. There were represented 349,360 shares out of the total issue of 585,753.

The Chairman said:—Gentlemen,—From the reports and accounts for the year ended 31st December last, with the details of which you have no doubt made yourselves thoroughly familiar, you will have seen that the milling operations of your company were appreciably expanded when compared with the previous year, the native labour position having been better throughout the period than for some time past. The tonnage milled was 638,860, or approximately 68,000 tons more than in 1914, the yield was 25s. 6d. per ton, or 1s. 11d. per ton less, but the total profit earned was practically the same, being £128,601 compared with £130,020 for 1914. This desirable result was achieved as a consequence of the greater tonnage handled and the very gratifying reduction in working costs of 1s. 4d. per ton milled—a notable figure, having in mind the very heavy addition to working costs due to the war. The year's working profit of £123,601, together with the balance of £148,712 brought forward at the beginning of 1915 and certain items of sundry revenue of which details are given in the accounts, gave us a total amount of £286,664 to handle. This was dealt with by distributing two dividends of together, 20 per cent., absorbing £117,151, Government taxes £6,630 and annuity in respect of our undermining rights amounting to £1,903, leaving a balance of £160,980 unappropriated and carried forward to the current year. Of this balance, £102,212 is actual cash after providing for all liabilities, the remainder being in stores and other cash assets—as you will have seen, we have been obliged to increase considerably the amount invested in stores and materials, in order to guard ourselves as far as we can against possible interruptions of supplies. From a consideration of these figures, gentlemen, you will at once realise the strength of the financial position of your company. I would now direct your attention to the condition of affairs underground in your mine. As regards development, you will see that we effected a footage of 19,169 feet during last year. This is a smaller footage than that for the previous year, and is, of course, due to the natural decrease in points of attack in a mine that has had the long and useful career which this has had. On the whole, the development in the lower part of the western section has given slightly better results than we have been in the habit of expecting in that locality, and in addition a very careful examination of the old workings has resulted in the location of considerable tonnages of reef which will materially add to our earnings.

Ore Reserves.

The ore reserves as recalculated at the end of the year under review are estimated at 1,826,800 tons at 6.1dwt., compared with 1,613,000 tons at 6.4dwt. at the end of 1914. There is thus an increase of approximately 213,000 tons and a decrease in value of .3dwt. You will bear in mind in this connection that the reduction in working costs during the year has brought into the payable reserves a fair quantity of ore only slightly above the pay limit, which, in turn, has had the effect of masking to some extent the slight but definite improvement in development and values that has been in evidence during the year's work. Looking at our position as a whole, therefore, I would say that the prospects for the current year, assuming a continuance of the present excellent labour supply, are brighter than has been the case for a very long time past; and in support of this I would add that our average working profit for the first five months of this year has risen to over £14,000, with a further reduction in working costs to approximately 21s. per ton. A quite satisfactory dividend distribution can therefore be reasonably anticipated. For the current half-year a dividend of 12½ per cent. has been declared.

Of course, it must not be overlooked that in a mine like this we cannot look too far ahead with much certainty, because our future depends to such a great degree upon what may be discovered in the lower part of the western section. As I have said, the year's development in that locality disclosed slightly better results, but the percentage of unpayable ground remains large. As regards working costs, also, although the reduction has been and is very gratifying, we cannot with reason expect any further sensational decrease, having in mind the antiquity of our plant and equipment, and the cost of keeping it in good condition and working order. There are, further, the very important facts to bear in mind that cost of stores and materials continues to increase steadily, and that the Government has unfortunately found it necessary to re-impose upon the industry for another year the special war levy of £500,000.

Elimination of Dust.

In common with other mines on the Rand, ever increasing attention is being paid to the elimination of dust and to underground conditions generally. During the year an additional ventilating fan of 114,000 cubic feet per minute capacity has been installed in the western section, rendering the mine thoroughly well ventilated. No fewer than 116 employes of this company are on active service; and I deeply regret to say that three men, viz., Lieutenant R. E. Gillett and Privates W. C. Goodwill and H. Atkinson, have lost their lives for the great cause. We have already conveyed to the relatives of these men our deep sympathy in the loss they have sustained. Many more men wished to serve, but could not be spared from our work, which is essential should be carried on at the highest efficiency. Our thanks are due to them for their loyal service throughout the year.

Mr. Edgar Pam left us at the end of last year to go on active service, and his duties as manager have since that date been most efficiently continued by Mr G. E. Tucker, with the able co-operation of your consulting engineer, Mr. E. H. Clifford. I now beg to move the adoption of the report and accounts for the year ended 31st December, 1915.

Mr. Connolly seconded, and the motion was carried.

Mr. Richter was appointed director, and Messrs. H. C. Boyd and R. W. Schumacher were re-elected to the directorate, and the auditors, Messrs. C. L. Andersson and Co. and A. Aiken and Carter were reappointed.

ROBINSON G.M. CO.

The annual meeting of shareholders of the Robinson Gold Mining Company Ltd., was held on Friday, Mr. F. Raleigh presiding.

In moving the adoption of the report and statements of accounts, the Chairman said:—The results of the operations for the past year are set forth in the directors' report, from which you will see that a working profit of £490,452 was earned. To this sum has to be added £26,060, being revenue derived from the treatment of the last of the accumulated slimes (£1,779), interest earned, sundry revenue and dividends on Crown Mines shares; on the other side there are debits of £52,506 for expenditure on donations, miners' phthisis assessment in respect of the compensation fund, and depreciation of investments. The resulting balance, £464,006, is carried to the appropriation account which, added to the credit balance brought forward from the previous year, and forfeited dividends, makes a total of £634,624. Of this sum an amount of £110,632 was paid to Government covering the annuity due in respect of the lease of certain undermining rights, tax on mining profits, special war levy, and income taxes imposed by the Union and British Governments. Two dividends, Nos. 46 and 47, of 8 per cent. and 6 per cent. respectively, were paid, which absorbed £385,000. Plant sold realised £472, leaving an amount of £139,464 to be carried forward to the current year. I regret that our holding in Crown Mines shares has again to be written down. The depre-

ciation in the market price for the year amounted to £41,000, which has been charged to working expenditure account, together with £3,568, representing the depreciation on Johannesburg municipal stock and Mexican trams, or a total depreciation of £44,568. When the Crown Mines shares were acquired by your company, the rate of dividend was 110 per cent. per annum; this fell to 65 per cent. for last year.

Regarding the operations of the Crown Mines, the net profit earned for 1915 was nearly equal to that of the previous year, and the difference in dividend declaration of 20 per cent. is accounted for by payment of the special war levy, improvement in cash position, and the larger sums invested in stores and materials due to the war. For the current year to date, the profit results show a considerable decrease. The annual meeting of the Crown Mines was held to-day, when the chairman stated that the outlook of the mine has recently improved, and he felt confident that the company would gradually overcome its present difficulties, which were largely of a transitory character and again show good profits. It was reported that the ore reserve totalled practically 10 million tons, valued at 6.25dwt. per ton This value is 1dwt. better than at the end of 1914.

The Balance Sheet.

Turning to the balance sheet, and when comparing it with that of the previous year, capital expenditure has been reduced by £472 due to sale of plant; the amount payable to the Union Government in respect of undermining rights acquired is reduced by £46,576; cash and cash assets, after allowing for all liabilities (excepting the balance of the Government annuity payable but not then due), show a reduction of £31,021, and, as before stated, amount to £139,464. There are no other points in the balance sheet to which I desire to draw your attention.

The Union Parliament has not yet dealt with the freeholders' share of the moneys paid to the Government for bewaarplaatsen. As you are aware, if this matter is settled in accordance with the recommendations of the Bewaarplaatsen Committee, which have been before the Union Parliament for some time, a considerable sum will accrue to this company.

I will now briefly deal with the operations of the past year. You will notice from the consulting engineer's report that the tonnage milled establishes a record for the company; this has been possible owing to the good labour supply. Notwithstanding lower working costs, the working profit earned was £79,901 less than during 1914, which is entirely due to the falling off in the value of ore treated, amounting to 4s. 4d. per ton milled. The consulting engineer, Mr. Percy Cazalet, in his report states that the chief cause of the decrease in the revenue per ton is the exhaustion of several rich leader and south reef blocks, increase in the proportion of main reef milled, decrease in the value of ore milled from surface dump, and additional cost of gold realisation due to the war, all of which are unavoidable in the case of this company. The tonnage mined was largely composed of ore recovered in reclamation work, amounting to 51 per cent. of the tonnage mined, as against about 35 per cent. for the previous year.

Working costs show a reduction of 8d. per ton milled. No development work was performed, the property being already fully developed. At the end of 1914, the total ore reserves were estimated by the consulting engineer at 1,229,100 tons. During the year 662,857 tons were mined, thus leaving a theoretical balance of 566,243 tons. At the end of December last the ore remaining in the mine is estimated to be:—

	Tons.
Leader and south reef ..	565,100
Main reef..	418,200
	983,300

In addition to which there is further main reef in the mine which may prove payable, and possibly further ore in the leader and south reef may be met with in certain sections of the mine when these are gone through before final abandonment.

Value of Ore Reserves.

No values are given by the consulting engineer to the ore reserves, owing to the impossibility of valuing a large portion of the tonnage. Comparing the ore reserve estimates at the end of 1914 with those at the close of last year, after taking into account the tonnage mined, it will be seen that there is a gain of some 417,000 tons of ore estimated to be payable, exclusive of the possibility of further payable main reef, leader and south reef to which I have referred. At last year's high rate of milling, the tonnage of 983,300 would keep the reduction works employed for about 1½ years, but, in practice, it will be impossible to mine the final tonnage in the mine at so high a rate. At the beginning of the year, there was about 60,000 tons of rock at No. 1 shaft surface dump; the value of this ore can only be determined as it is taken for milling purposes. Regarding the current year, we have now completed five months' operations. The working profit has averaged £29,906 per month, which is about £11,110 per month below the average working profit for last year. The tonnage milled has been maintained at an average of 57,660 tons monthly, as against 57,400 for last year. A dividend of 4 per cent. has been declared by the board for the current half-year. As you are aware, the Robinson Deep Company adjoins a portion of our southern boundary. Under the Mining Regulations a safety pillar has to be left by each mine on its boundary, but on the joint application of owners of adjoining mines, the Inspector of Mines may give permission to remove such. Naturally, we desire to work out our boundary pillar before abandoning the mine, and the necessary application of both the Robinson Deep and ourselves has been made and agreed to by the inspector for the mining of the whole joint pillar. As the Robinson Deep wished to obtain additional ventilation to their mine, negotiations were entered into, and an arrangement made under which the Robinson Deep boundary pillar of 10 feet in both reefs is mined and milled by this company for its own profit, and in return this company provides ventilation facilities to the Robinson Deep, consisting of installation of additional ventilation plant and cost of its running, together with certain walling, timbering, etc. The tonnage of ore so taken over by this company is estimated at about 11,100 milling tons, and after providing for the estimated expenditure of £10,000 on the foregoing items, it is expected that the company will make a reasonable profit out of the arrangement in exchange for the facilities granted. In addition, this company has arranged to take over, that is to say to mine and mill, certain ore belonging to the Robinson Deep in the vicinity of their boundary pillar, estimated to total about 46,359 milling tons, for which this company will pay the Robinson Deep £48,000 in 12 monthly instalments of £4,000. This arrangement is of mutual advantage, and this company should make a fair profit out of the transaction.

Additional Tonnage.

The additional tonnage secured as above, added to the tonnage still in the mine, and on the surface, totals 1,100,300 tons, which is equivalent to nearly one and three-quarter years' working at last year's rate of milling. As previously indicated, it will be necessary to continue operations on the same scale as last year. In all probability, however, it will take two years from January 1 last, [illegible] mine on the basis of the tonnage mentioned. This estimate does not take into account the possibility of further reef discoveries between the 12th and 13th levels, mentioned by Mr. Cazalet. Necessarily the monthly profits will fall to the final exhaustion of the main reef ore. You will note that the accounts show a provision of £21,000, being the estimated amount of the special war levy of £5 per cent. levied by the Government on mining industry. This levy is calculated to recoup the amounts paid by mining companies under the Mining Taxation Act for the Government's financial year ended 31st March, 1916. This year the Government finds it necessary to impose a similar levy of £5 per cent. for the year ending 31st March, 1917, which will be collected in the same way. In view of the considerable reduction in profits for the current year, the contributions to the war levy is likely to be less. At the end of the year 66 of the company's employees were on active service, of whom 11 have died in Europe. Provision has been made for assisting the dependents of those employees while they are away, and their return will be maintained in employment. I regret to say that Lieutenant D. G. Hedding, one of the company's employees, has been killed on active service. I would extend our sympathy to his relatives. Our acknowledgments are due to Mr. Percy Cazalet, the company's consulting engineer, the manager, Mr. Parker Cazalet, who I am pleased to say has recovered from a very serious illness, the mine and head office staffs and employees for good services rendered to the company.

The motion was adopted.

CITY DEEP, LIMITED.

The fifth annual general meeting of shareholders in City Deep, Ltd., was held [illegible] on June 22nd in the Board-room, Corner House, Mr. H. A. Wilders presided, and there were also present Messrs. F. Rafelig, [illegible] Gill, H. Newhouse, F. H. [illegible] Stool, J. R. Nicholson, [illegible] C. Dumat, H. H. M[illegible], [illegible] Ryan, W. F. Birch, A. J. W[illegible], W. Dalrymple, A. S. Peirs, [illegible] and O. D. Wright, representing [illegible] shares out of an issue of 1,250,000.

The Chairman, in moving the adoption of the report and accounts, said:—At the last annual meeting of this company we were in the fortunate position of being able to congratulate ourselves on the fact that we had secured substantially better results than during the year preceding. On this occasion it is a pleasure to place on record a further marked improvement in every direction, and that our operations during 1915 have resulted in a very much larger profit than anything that has been previously recorded. The tonnage milled during the year was 677,200, or practically 17,000 tons more than in the previous year. The value obtained was 28s. 7d. per ton, which is showing some slight increase, and the working costs at 20s. 5d. per ton show a substantial reduction of 2s. per ton. This is an especially gratifying feature when it is remembered how heavy are the additions to working expenditure due to the war. The result, therefore, of these operations has been that the total working profit for last year, including that from the treatment of accumulated slimes, was £621,108, being in round figures an increase of £216,000 over the record established in the year prior to the one that we are reviewing. The native labour supply has been good, and extensive improvements in underground and surface arrangements and generally improved organisation have produced these results.

Financial Aspect.

I will first review just briefly the financial aspect of last year's operations. As you will see from your working expenditure and revenue account, the working profit, including that from accumulated slimes, of £621,108, to which I have just referred, was increased by the addition of the difference between sundry items of revenue and expenditure to £634,632, which amount was carried to appropriation account and, together with the balance brought forward at the beginning of 1915 of £140,147, gave us a total amount available on that account of £774,779, which was dealt with in the following manner:—Two dividends of, together 33⅓ per cent. were distributed during the year and absorbed £421,875, the net expenditure on capital account was £35,570, annuity paid to Government in connection with our undermining rights £6,560, and Government taxes £93,626. The balance unappropriated and carried forward to the beginning of this year was £206,948, of which £136,455 was actual cash, the remainder being represented by stores and materials and other cash assets. The amount invested in stores and materials is, as you will see very much larger than is usual, but the wisdom of strengthening the position as much as possible will be at once apparent to you under the circumstances. I think that these figures I have just put before you sufficiently clearly indicate the strength of your financial position.

Capital Expenditure.

As regards the capital expenditure for last year, you will have seen the details in the reports in your possession. For the current year we shall be concerned chiefly with the expenditure necessary to complete the Butters filter and other necessary alterations to the treatment plant, amounting in all to approximately £40,000. Other expenditure which may also be incurred during the year is in the completion of the votes authorised in connection with the conversion and electrification of the south Whiting hoist, and this expenditure will be approximately £20,000. As you will have realised, the surplus funds in hand at the end of last year were more than ample to meet this expenditure.

The ore reserve position is highly satisfactory, the total tonnage of payable ore being just under 3,000,000 tons of an average value of 9½ dwts. The tonnage in reserve shows an increase when compared with 1914 of 466,000 tons, and there is a fractional decrease in value, mainly on account of the inclusion in the reserve of a substantial quantity of low grade but payable main reef. I would draw your attention to the full details of these figures that are given in the consulting engineer's report.

Development Operations.

We will now consider in some detail the development operations that took place during the period we are reviewing. As you will have observed from a study of the reports, the total development footage for 1913 of 27,501 feet showed an appreciable increase when compared with the previous year particularly satisfactory is this increase in view of the fact that we were unfortunately not able to sink either of the main incline shafts, and therefore had no new levels to open up. I would add here, however, that since the beginning of this year No. 1 incline was started on the 13th level, and now has nearly reached the horizon of the 14th level. Further, the new main hoist at No. 2 incline shaft arrived after much delay, has been erected, and I am very glad to say started working within the last few weeks. Apart from a few minor rearrangements, there is nothing to prevent us going ahead as rapidly as possible with the sinking of these two inclines, and the anxiety that we have sometimes felt in this connection will soon be a thing of the past. Returning now to last year's development operations, we continued to open up very valuable ore on the main reef leader in all the upper level drives, i.e., levels 2 to 5 inclusive. This ground has been wonderfully consistent, and indeed we take it as a matter of course in that locality to develop nothing but very high grade ore month after month. The development of the intermediate levels, viz., 6 to 9 inclusive, is practically completed and the major portion of the ore has been stoped. As regards the bottom levels, viz., 10 to 14 inclusive, whilst we do not find such rich ore here as is contained in the levels 2 to 5 to which I have referred, yet the values are satisfactory and the percentage of payability is high. An encouraging feature is the good grade of the ore that we have encountered in the bottom levels in the neighbourhood of No. 1 shaft. The possibilities of the south reef have not been lost sight of, and in one or two places where we have done just a little work on this reef we have met with quite encouraging values. In view, however, of the consistently payable nature of the main reef leader, upon which the bulk of our work is concentrated, the time is not ripe to launch out on any extensive development policy in regard to the south reef.

Surface Plant.

As regards our surface plant, you will remember that at the last annual meeting I referred to the decision to instal a Butters filter plant, the object being to improve the metallurgical efficiency and also to increase the total capacity of our plant. Many unforseen delays have unfortunately been met with in obtaining delivery of the machinery necessary, and I regret to say it will still be several months before we are likely to have this plant in running order. It is a pity, because we feel the shortage of treatment capacity more especially during the cold weather, but we must all realise that delays in obtaining new plant in these times are bound to occur—we have a vast amount to be thankful for as it is. Safety measures, as a whole, continue to receive most careful attention, and as regards sand-filling the areas most urgently requiring it are now secure. The arrangements for sand-filling in the western portion of the mine, to which I referred last year, have been modified to some extent, and we are now sinking a 7in. borehole on our own property, and intend transporting sand to it on the surface from the Wolhuter dump.

As regards health conditions, upon which your company has expended much thought and money, the circular shaft arrangements generally, and the ventilating fan there in particular, have been in operation now for a year, and most satisfactory results have been achieved in improving the quality of the air and diminishing the temperature throughout the whole mine. These arrangements have contributed not a little to the great improvement in the results to which I have had the pleasure of drawing your attention.

This Year's Work.

To complete my review, I will now refer shortly to the results that have been obtained since the commencement of the current year. The position is that the tonnage, profits, and working costs show an improvement still greater than those obtained during the year I have just been considering, and we are safe in assuming that the dividend distributions for this year will show a satisfactory increase on the amount distributed last year. For the current half-year a distribution of 22½ per cent. has been declared. It has, of course, to be borne in mind that the Union Parliament has reimposed upon the industry the special war levy of £500,000. The average tonnage milled per month for the five months ended 31st May last is 61,540 tons, the average monthly profit is approximately £60,000, and the average working costs are 19s. 9d. per ton. Development operations continue to expose good values, and I give you below the tonnage and the value of the ore developed in the drive faces of all the levels since the beginning of this year:—

EAST.

No. 2 Shaft.	Footage sampled.	Reef width.	Value.	Inch-dwts.
2nd level		Drive completed.		
3rd level	95	38.9	58.9	2294
4th level	100	20.5	24.2	496
5th level	120	34.0	25.0	851
10th level	170	32.8	20.8	682
11th level	70	51.0	9.0	457
12th level	90	43.7	9.9	432
13th level	210	36.5	12 0	439
14th level	180	24 8	13.1	325
No. 1 Shaft.				
11th level	30	55 0	10.4	572
12 h level	60	8.5	44.6	379
13th level	160	22.3	18.9	421

WEST.

No. 2 Shaft.	Footage sampled.	Reef width.	Value.	Inch-dwts.
2nd level	165	44.0	51.0	2244
3rd level	290	32.6	24.3	792
4th level	135	38 9	24.2	939
5th level	40	26.3	17.5	460
10th level	300	55.0	9.6	528
11th level	215	41.0	5.4	219
12th level	165	57.3	11.2	642
13th level	Broken ground—no samples.			
14th level	90	45.7	14 8	675
No. 1 Shaft.				
11th level	85	20.0	7.5	149
12th level	60	9.5	17.0	161
13th level	Not on reef			

The desire of the employes of this company to go on active service was, needless to say, very marked. We were able to arrange for 98 of the company's employes to serve and of course liberal allowances are made to the families and dependents of these men. I regret to say that one of them, Trumpeter S. H. Curtis, has already lost his life for the cause, and we have conveyed to his relatives our sympathy in the loss they have sustained.

The management of the mine remains in the able hands of Mr. Percy Sherwell, under the guidance of your consulting engineer, Mr. E. H. Clifford. To these gentlemen and to the staff and employes generally, who have given loyal service throughout the year, the greatest credit is due for the excellent results that have been obtained.

I now beg to move the adoption of the reports and accounts for the year ended 31st December, 1915.

The report and accounts were adopted.

Messrs. F. G. C. E. Robellaz and W. H. Dawe, retiring directors, were re-elected.

Messrs. C. L. Andersson and Co. and Mr. Chas. Stuart were reappointed auditors, and voted 250 guineas each for the past audit.

BANTJES CONSOLIDATED.

The annual meeting of shareholders of the Bantjes Consolidated Mines, Ltd., was held on June 19 in the boardroom, Corner House. There were present Messrs. F. Raleigh (chairman), H. A. Rogers, A. G. Gill, W. T. Graham, E. A. Wallers, W. H. B. Frank, A. F. Mullins, F. de Ferrieres, F. W. Baxter, A. Sprinz, G. Sonn, F. H. McNeill, A. Lipman, B. Rothschild, W. Gordon, F. H. Barry, and S. C. Steil (secretary).

The Chairman said:—Gentlemen,—As you are aware, the working profit earned last year amounted to £9,421. After adding interest, exchange, estate and other revenue, and deducting assessment on account of Miners' Phthisis Compensation Fund and donations, a credit balance of £9,923 is carried to the appropriation account, which, with the credit balance at the commencement of the year under review (£58,335), and credit on

capital account for the year (£724) makes a total of £68,982 to be accounted for. Out of this sum Government taxes were paid absorbing £260, and £68,722 was carried forward to the current year, being an increase in the net cash and cash assets of £10,387. No dividend was declared owing to the company's uncertain position, and I am sure you will agree with the policy adopted by the Board of conserving the company's cash for the development of the mine. Of the credit balance carried forward £26,477 was in the form of cash, the remainder being invested in cash assets, which are detailed in the directors' report. In addition, the company had the sum of £35,784 to the credit of mine development suspense account, which was also in the form of cash, so that the total cash resources amounted to £39,561. With the exception of the increase in the cash and cash assets before referred to, there is little change in the balance sheet as at 31st December, 1915, if compared with that of the previous year. The proceeds of stands sold for the year and sales of plant are credited to capital expenditure accounts. The expenditure on shaft work for the year (£457) was provided out of the development suspense account.

The Year's Difficulties.

In regard to the operations for the past year, you are aware that we commenced the year under great difficulties, as on the 19th of December, 1914, the main incline shaft collapsed, preventing the hoisting of rock through our main shaft until the end of February. The tonnage milled shows a decrease of 26,999 tons compared with 1914; the yield a reduction of 2s. 1d. per ton, and as a partial offset the Working expenditure showed a reduction of 7d. per ton. Considering the lower scale of operations for the year, the higher cost of stores, and the large development footage accomplished, this reduction of working costs is very satisfactory, and, I think, reflects credit on the management. The development operations for the year were seriously interfered with during the first four months by the breakdown referred to, but for the last four months averaged slightly over 1,400 feet per month. In all 14,382 feet were accomplished. This large footage exposed only 123,650 tons of payable ore, as against 256,559 tons mined. The ore reserves on reestimation at the end of last year showed a decrease of 152,400 tons, the value remaining the same i.e., 6.1 dwts., when including shaft, boundary and safety pillars of a value of 7.3 dwts. per ton.

Development Operations.

At our last meeting I referred to the poor values exposed by development operations of the previous 18 months, which was having such an adverse effect upon the ore reserves, and then stated that our policy was to push on development in the hope of encountering better ore beyond the areas exploited, and that prospecting of the leader was receiving attention, as in the lower levels payable values had been encountered in this reef and in the adjoining mine (the Main Reef West) on the east. Further, that comparatively little development work had been done on the leader, as up to that time the mine had been a South Reef proposition. As the poor values still continued in the South Reef development it was decided on the recommendation of your late manager, Mr. W. W. Lawrie, supported by Mr. Percy Cazalet, the consulting engineer, practically to abandon regular development in the South Reef owing to its poor value, and to concentrate development operations on the leader, and at the same time to increase the development footage as much as possible. This change of policy was fully advised to shareholders in the quarterly report to 30th September last, and I am pleased to say that it has proved to be right, the results so far obtained in the [illegible] having exceeded [illegible] values obtained in the [illegible] three months of this year [illegible] vised to shareholders, and [illegible] the values obtained in [illegible] cent from 1st August, 1915, to [illegible] 1916, which covers the [illegible] the balance of development [illegible] has been no less than 2,572 [illegible] past nine months. After care[illegible] reckoning the matter, the manage[illegible] of opinion that while we were [illegible] rate of about 3,000 tons in January last from the leader by the end of the year six months' tonnage will be about [illegible] from the leader. This is

	EAST					WEST				
	Footage Sampled.	Reef Width	Inch Value	dwts.		Footage Sampled.	Reef Width	Inch Value	dwts.	
NO. 1 SHAFT—										
8th Level	170	1·6	4·4		M R L					—
10th ,,	25	9	28·6	23	M R L					—
NO. 2 SHAFT—										
5th Level	—	—	—	—		—	—	—	—	—
6th ,,	—	—	—	—		200	1·6	33·6	13	M R L.
7th ,,	—	—	—	—		140	9·0	19·6	19·6	M R L
	—	—	—	—		75	3·0	4·7	186	M R & L
	—	—	—	—		20	6	14·2	85	M R L.
8th ,,	—	—	—	—		25	80	5·6	444	M R & L
	—	—	—	—		150	76	8·5	85	M R & L.
	—	—	—	—		240	71	4·9	234	M R & L.
9th ,,	—	—	—	—	—	245	73	7·1	516	M R & L
10th ,,	275	15	11·6	217	M R L	320	32	1·6	53	M R
11th ,,	—	—	—	—	—	185	18	4·4	87	M R L
12th ,,	—	—	—	—	—	120	6	78·1	446	M R L
	—	—	—	—	—	30	9	14·4	129	M R L.
13th ,,	—	—	—	—	—	475	20	9·2	185	M R L.
	—	—	—	—	—	25	8	10·6	88	M R L.
	—	—	—	—	—	5	40	9·1	364	M R & L.
14th ,,	195	24	18·3	445	M R L	330	58	5·4	307	M R & L.
	—	—	—	—	—	135	66	5·6	370	M R & L.
15th ,,	—	—	—	—	—	65	62	8·6	531	M R & L.
16th ,,	—	—	—	—	—	300	8	22·6	180	M R L.
	—	—	—	—	—	80	27	11·4	306	M R L.
NO. 3 SHAFT—										
4th Level	—	—	—	—		150	25	5·4	135	M R L.

At the time when the board decided on a change of policy arrangements were made with the adjoining mine, the Main Reef West Company, for that company to drive into this company's mine, in order to test the value of the leader at a depth of some five or six levels below the present depth of the main incline shaft, payable values having been obtained by the Main Reef West Company in the vicinity of our boundary. This work has been carried on continuously until the end of last month, when driving was discontinued, the object having been achieved by the proving of payable leader in our ground. The values obtained to the end of each quarter have been advised to you, and for the two months ended May 31 last the values for 90 feet sampled in the leader and main reef were 5.5 dwts. over a reef width of 71 inches per ton. In all, 433 feet of driving were done, and of this footage 270 feet were sampled, showing an average value in the leader and main reef for the whole distance sampled of 6.7 dwts. over a reef width of 62 inches. Seeing that the end of the drive is 320 feet east from the line in which our incline shaft will eventually be sunk, there is no further object in continuing it, owing to the very long time which must elapse before the payable ground encountered could be mined. The depth of this level below the present workings is well illustrated by reference to the plan attached to the report before you. The number of leader drive faces being advanced in payable values since the end of last year, are in January 10, February 9, March 10, April 8, May 11. The tonnage of payable ore exposed for this period in the leader and main reef was estimated to be 57,850 tons, of an estimated value of 7.7 dwts. per ton.

Payable Areas.

You have seen that we have at last again opened up payable areas, and we have every reason to expect them to continue, as they are not confined to one particular area of the mine, but are fairly general throughout the workings of the leader, from the 7th to the 16th levels. You will naturally be anxious to know when the effect of the leader development will be felt in the reduction works, and I have discussed this matter very fully with our consulting engineer. In the first place, we have to remember that as the drives from the shafts have been laid out in the past for the chief purpose of working south reef ore, the change of policy has necessitated a very large amount of dead work in the form of crosscutting from the south reef to the leader. This work does not develop any ore. The leader is situate on the average about 180 200 feet from the south reef. The amount of crosscutting probable, according to estimate. It will be seen, therefore that during the current year the full effect of our recent improved development and value of leader will not be felt. Shareholders will understand that in reality the company is practically opening up a new mine, and it will obviously take some time to do this, during which they must exercise patience. As before stated, at the close of the year the actual cash in hand, after providing for all liabilities, was £39,561, including the development suspense credit, since then, i.e., for the five months ended May 31 last, this balance has been reduced to £28,757, being a decrease of £10,804. This decrease is made up of—

Additional cash assets acquired chiefly in respect of stores and materials	£7,282
Net loss	3,308
Spent out of development suspense	591
	£11,181
Less sales of Florida stands	377
	£10,804

It will thus be seen that the company still has a good hand in hand with which to prosecute a vigorous development policy. Regarding the loss made for the current year to date, it must be remembered that we are now expending a over £6,000 a month on development, which is a very heavy tax on the working costs.

We have yet to complete the rehabilitation of the main incline as it from the surface for about 100 feet by covering the three compartments of the shaft which were left to be completed later when the repairs were effected at the commencement of the last year. It is intended to recommence shaft sinking as soon as the necessary arrangements can be made provided funds permit.

Rock in the Leader Stopes.

The management has reason to think that breaking of rock in the leader stopes will cost less than was the case with the south reef stopes, as not only can a greater width be mined, especially where the leader is in proximity to the main reef, which latter sometimes carries payable values, but the rock is easier to break and rock-drills can be used. Whilst we have obtained most encouraging results thus far in the leader, we have still a large amount of work to do before we are in a position to keep the mill fully employed on ore from that reef. I would call your attention to the following paragraph in the consulting engineer's report referring to the new policy of leader development. He says:—

"It is, of course, too early as yet to anticipate the results which may be ex-

nected, as the levels come to be opened up both laterally and in depth, or what the effects may ultimately be on the ore reserve position, but it may be accepted without reserve that the outlook of the mine is already, in consequence of these exposures, much more satisfactory than a few months ago. Even if these present good values continue, however, a period of anxiety and small returns must be anticipated while the ore now being exposed is being rendered available for crushing; during this time only small profits can at best be anticipated, and even these are not assured during the coming few months."

Since the foregoing was written, as you have gathered from my remarks, the good development results have continued, but we still have an anxious period ahead, and it is impossible in the present transition stage either to forecast profits or losses. All I can do is to afford you the fullest information available. A disconcerting factor in regard to the current year's operations is the fact that the yield now being obtained is below that called for by the present ore reserves. As a result of our experience we have reasonable grounds for feeling that this falling off is only temporary. On the whole, we have every reason to congratulate ourselves on the improved outlook of the mine. We have been, and in fact still are, passing through a period of extreme anxiety to all concerned. Seventeen of the company's employes are away on active service, and I am pleased to say that so far there have been no casualties amongst them. Liberal allowances are being made to these employes, and those who return after the war will be reinstated.

I desire to record the board's appreciation of the work done by Mr. Cazalet, the consulting engineer, and Mr. W. W. Lawrie, who was our manager until 11th October of last year, when he resigned his appointment to take up the management of the Nourse Mines, Ltd. Mr. Lawrie was succeeded by Mr. G. Hildick-Smith, late underground manager at Ferreira Deep, and to him and to the mine and head office staff employes I voice our appreciation of the good work done by them.

In now beg to move the adoption of the reports and accounts for the year ended 31st December, 1915.

Mr. Sprinz seconded and the motion was carried.

Messrs. H. A. Rogers and F. Raleigh were re-elected to the board, and Messrs. E. Danckwerts and C. L. Andersson and Co. were reappointed auditors, and their remuneration for the past audit fixed at 150 guineas each.

GOERZ AND COMPANY.

Mr. H. Newhouse presided on June 16at the annual meeting of Goerz and Co., Ltd., held at Silesia Buildings. Others present were Messrs. B. Madow, G. D. Stollreither, W. P. Cruddas, W. H. Crowhurst H. B. Walker, and V. J. Ronketti (secretary).

In moving the adoption of the annual report and accounts, the Chairman said:—It is a source of keen satisfaction in more than one way that the Rand gold mining industry has continued, in spite of the war, not merely to maintain its output during 1915, but to substantially increase it, and at the same time to prepare for further expansion. Our group of mines, you will be glad to know, has contributed much more than its full share to this increased output, and I am confident that further progress will be made by us in the current year. Before dealing in detail with the position of the properties in which we are chiefly interested I propose to run through the chief items of the accounts. You will observe that a profit of £38,602 was made last year, comparing with a loss of £295 for the previous year. The improved result is due on the one hand to an increase from £4,968 to £30,818 in our realised profit on sale of shareholdings, and from £19,610 to £30,051 in our revenue from dividends and interest, while on the other hand it was possible to further reduce our general expenses, the total for the year being £21,488, as compared with £28,231 for 1914 and with £39,321 for 1913. The bulk of the saving in last year's expenses is due to a further reduction in the item of salaries, less fees received, which accounts for £3,429. After allowing for a debit balance of £19,819 brought forward from 1914, we carry forward a balance of profit of £18,683 to the present year.

Confidence in the Future.

Turning to the balance sheet, creditors have risen from £381,090 to £548,302 owing to an increase in the deposits made with us. On the asset side of the balance sheet the item of shares and debentures in other companies stands at a book cost of £1,280,279, an advance of £115,539 as compared with the previous year. This increase is mainly due to the exercising of the options we held over the Modderfontein Deep and Geduld Proprietary shares. Advances to mining companies dropped during last year from £371,038 to £252,329, and other sundry debtors remain practically unchanged at £52,682. The bulk of our free cash resources has been invested in British Treasury bills, which at the end of the year were held to the amount of £232,121. The sum temporarily locked up under the emergency regulations of the London and Paris exchanges was only £2,702, and this amount we include in sundry debtors, and not in the £70,639 of temporary advances against securities, all of which is available at short notice. Shares to the value of £11,876 are in Germany, and the only other assets tied up there as a result of the war are £13,927 of advances against securities and £5,150 of other debtors, both included in sundry debtors in the accounts. There is good reason to look into the future with confidence seeing that henceforward our revenue from dividends is likely to be considerably enhanced, and in this connection I may say that the dividends and interest item in the present accounts does not include the mining dividends declared in December last, as they only became payable in the new year. At the same time shareholders should not assume from this or from the reference to the aggregate value of our shareholdings made in the annual report that the company will be in a position to resume the payment of dividends in the immediate future. I wish to remind you that our former practice was to write down each individual shareholding to the market value, if that was below cost. Since 1910 our position has not been sufficiently prosperous to enable us to carry out this very usual and proper practice, and consequently we still have considerable depreciation on certain shareholdings, for which it will be necessary to provide in some manner before we can resume the payment of dividends. You will no doubt also agree with me that it is very desirable for the company, especially in these times, to strengthen its position.

Rand and the War.

Mr. Cameron, your late consulting engineer, in his report for 1915 has as usual prefaced his review of the position of the companies in which you are more particularly interested with some remarks regarding the operations of the mining industry as a whole. Their perusal reveals some rather remarkable features. Perhaps the most prominent is that the total tonnage milled by the mines on the Witwatersrand was a little more than 10 per cent. in excess of the figure attained in 1914. This result, apart from the increase attributable to the mill of the Government Gold Mining Areas having been in operation for the full year as compared with only a short period in 1914, and to the advent of the Modderfontein Deep Levels as a crushing company, was principally due to the satisfactory supply of native labour. The number of natives employed, you will note, increased during 1915 by over 25 per cent. being, for at any rate part of the year, ample for all requirements, and the force available has since continued to be reasonably satisfactory. This favourable factor has served very appreciably to counterbalance the adverse influence of the world-war in every other department of the mines' operations. The cost of stores has persistently risen, and you will observe Mr. Cameron estimates that during 1915 working costs were higher by about 7d. per ton milled owing to this cause. Prices have continued to advance, and, comparing the cost of stores for last month with that for May, 1914, the extra charge falls little, if at all, short of 1s. per ton milled. The expense of shipping and realising the gold—which some companies charge against sundry revenue, but which the companies you are interested in debit to working costs—has also increased very largely. Further, the allowances paid to the men on active service and their dependents must be taken into account. Taking our group at the end of last month, out of about 750 white employes 112 were serving their country, and they or their dependents were in receipt of allowances totalling £832 per month. In addition, the companies are still contributing liberally to the various war funds. Needless to say, many members of your own staff, both in London and here, have also enlisted. In this connection a tribute of praise is due to those employes who have not been able to proceed to the front, though desiring to do so. Their attitude has been uniformly helpful, and they have shown their gratitude in a very practical form to those who have been able to go by generous contributions to the war funds. The total amount subscribed on the mines of your group from the beginning of the war up to the end of May was no less than £7,420. Finally, the mines have granted the lower-paid married employes a war bonus to meet the extra cost of living. Nor must the fact be lost sight of that, broadly speaking, all the men on active service have had to be replaced by less experienced men, who have only gradually become efficient. Yet, in spite of all these factors tending to put up working costs, the total increase registered for the year is only 4d. per ton milled. It may safely be said that, had the native labour position not been so good, this figure would have been approximately trebled. In fact, the influence of the better supply of labour made itself felt as much in rendering it possible to organise more satisfactorily on the basis of having sufficient natives for all work as in enabling a greater tonnage to be milled.

Taxation.

The average yield of all mines on the Rand showed only the small reduction of 3d. per ton milled, so that the working profit was down 7d. per ton. The dividends paid in respect of 1915 were £554,000, or say 7 per cent., less than in the preceding 12 months, and this notwithstanding that one new dividend-payer—the Modderfontein Deep—was added to the list. Had it not been for the amount distributed by this mine the decrease would have been £729,000, or 9 per cent. This shrinkage in the dividends is, of course, very largely due to the special war levy imposed by the Union Government, the amount of which, in the great majority of cases, has been debited in last year's accounts. I am sorry to say that this special war tax, though originally levied for one year only, has been reimposed for the current year, but there is reason to hope that it will not be enforced for a third time. Remembering that the mining industry has to bear its share of practically every form of taxation imposed, there is no doubt that through this levy it is called upon to pay a larger proportion of the extra taxation which circumstances have compelled the Union Parliament to enforce on the country as a whole than is, strictly speaking, justifiable. One of the gratifying features of the year's work has been the continuance of satisfactory relations with the white employes of the mines. Points of difference have naturally arisen, but these have been settled by friendly negotiation. Perhaps the most important of these points was the grant, in August last, of a war bonus to the lower-paid married employes, to meet the extra cost of living. This question continues to be the subject of keen discussion, but it is sometimes overlooked that the shareholders have also to suffer from the consequences of an increase in the cost of living. Under the prevailing circumstances everyone must expect to make some sacrifice. The profits of the mines are certainly suffering materially owing to the war, and if it is remembered that such profits are distributed in the shape of dividends among a multitude of small shareholders—

I mean people often of slender means and that their purchasing value has dropped proportionately to the increase in living expenses which in Europe, where most of the shareholders live, is much greater than out here you will I think, admit my point as to the effect on shareholders of the rise in the cost of living. In other words, the rise in the price of goods affects all parties interested in the industry those who receive wages, as well as those who receive dividends.

Phthisis and Accident Prevention

During the past year the mines, of their own accord, brought into force leave regulations applicable to all white employees. These are framed on a scale which may safely be said to be much more liberal than that of any other industry in the world. Constant efforts, too, have been made to improve the condition of the mines, from a health point of view, and it is gratifying to observe that these have been so successful that the Minister of Mines was recently able to state in Parliament that the incidence of miners' phthisis has become greatly reduced. This remark was made during the discussion on the Act just passed revising the Miners' Phthisis Act of 1912, giving greater compensation in certain cases and providing for the gradual elimination of what has long been recognised as a source of great danger namely, men suffering from tuberculosis pure and simple or tuberculosis and miners' phthisis combined. This measure inflicts a substantial further burden on the mining industry, but it will be cheerfully borne if this step, together with other proposals contained in the Act, have the anticipated effect of still further reducing the incidence of miners' phthisis until it becomes practically eradicated. You will notice that Mr. Cameron, when dealing in his report, with this point, states that those who have given much time to the study of this disease and its prevention are of opinion that the malady can to-day only be contracted in the mines of the Rand through gross carelessness on the part of the employe himself. Another matter to which ever-increasing attention is being paid is the prevention of accidents. A special committee, formed some time ago to deal with this subject and having among its members the Government mining engineer as well as representatives of all directly concerned in the running of the mines, is constantly gaining impetus, and its work has already been acknowledged by the Government to be of high value. You were no doubt pleased to see that the first prize offered for competition among the mines was won by one of the companies in which you are directly interested—I refer to the Geduld Proprietary Mines. The other mines of the group also put up an excellent record, as is shown by the fact that the accident death rate on the four properties was only 1.45 per 1,000 per annum, as compared with 3.17 per 1,000 per annum for the Rand as a whole.

Absolute Necessity.

Those directly concerned with the management of this industry have been congratulated a great deal on being able to continue work uninterruptedly. In accepting these compliments, however, it is necessary not to forget that the real reason for this undisturbed progress is to be found in the fact that of all war industries the gold industry cannot yield precedence to any. Its product is an absolute necessity to the British Empire. For this very vital reason we continue to receive assistance, whenever required, not only from the local Government, but also from the Home Government—help which, needless to say, we highly appreciate. Nevertheless the mines have thought it necessary greatly to increase the stock of stores carried. The value of the stores carried by the four producing mines in which you are directly concerned was £5,536 at the end of 1911 while at the end of last month it stood at £127,064. In normal time it would be about £60,000. We also have to thank the Bank of England for the satisfactory terms on which it takes over our product. While at the commencement of the war the bank gave us credit for only 97 per cent. of the sterling value we are now receiving credit for 98 per cent., the balance being retained to cover charges. On the present outlook this balance should leave some margin, which will, of course, eventually accrue to the companies. Another item for special acknowledgement is the treatment the industry has been accorded in the matter of explosives, which are a prime essential for its work. Naturally it has been asked to cut down the proportion of high grade explosives used, and I am glad to say it has succeeded in doing so to a very great extent. While before the war of the explosives used on the Rand 70 per cent. contained at least 75 per cent. nitro-glycerine in April last only 19.9 per cent. was of the higher grade, the percentage for the mines of your group being only 9.29. That the condition of the industry is healthy and sound is, I think, shown by the continued confidence of the South African public, which is strikingly indicated by the fact that of the dividends declared by companies which are members of the Transvaal Chamber of Mines in respect of the last half of 1915 totalling £3,706,229 shareholders resident in South Africa, exclusive of finance companies, received no less than £464,316 or 12½ per cent. The general confidence in these fields is also indicated by the interest now being displayed in the far East Rand. The question of how this area is to be dealt with has just been considered by a Select Committee of the House of Assembly, to which was submitted one of the most important documents ever penned in connection with these fields—namely, a memorandum from the Government Mining Engineer on its possibilities. It would lead too far to attempt in any way to summarise this memorandum, nor need I do so as no doubt it is familiar to all of you. The increasing importance of this area is also indicated in the annual report of your company now in your hands. You will gather therefrom that the proportion of the total output of the Rand coming from the district in question has increased from 4.6 per cent. in 1911 to 16.5 per cent. in 1915, while the proportion of the dividends has gone up from 4.3 per cent. to 24.8 per cent. in the same period. Your company is, of course, particularly interested in this area through the Geduld Proprietary Mines and the Modderfontein Deep Levels—two of the seven mines responsible for the splendid results I have just alluded to—while we also have other large interests there. It is due to the two mines I have named that the output of gold from the properties of the group has, at £1,607,773, been practically doubled during the year under review. I will now, with your permission, refer briefly to your principal interests.

Modderfontein Deep Levels.

The Modderfontein Deep has continued to make progress in every direction. After the mill had been running only seven months the consulting engineer was able to recommend an increase of the plant by 10 stamps and accessories, bringing it to a capacity of 40,000 tons per month. The additional plant was started 10 days ago, or well in advance of the scheduled time—a record which is particularly noteworthy in view of the state of war and the consequent shipping difficulties. The original plant has become more and more efficient. The working profit has averaged over a sovereign a ton, while costs have, as I anticipated, continued to decrease, the May figure being only 16s. 7d. per ton. It is reasonable to anticipate a further decrease in the costs per ton when the new plant [illegible] settle down and the full [illegible] expected to obtained. If [illegible] realised the profits per [illegible] increase more than proportionately. The profits earned were such that a first dividend of 2½ per cent. was declared for only six months' work. The two dividends declared last year totalled 35 per cent., while one year before yesterday [illegible] declared the third dividend [illegible] in respect of the first half of the year, of 30 per cent. The development of the mine continues to reveal excellent results. The estimate of the ore reserves at the end of last year showed an increase of 22[illegible] tons and an improvement in value of 3 dwts. per ton over a stoping width which was 4 inches greater than at the end of 1914. Since then the development have continued to be satisfactory, the 95[illegible] feet sampled in the first quarter of this year giving an average assay value of 9.9 dwts. over 52.2 inches, a value which has been more than maintained since that date.

Geduld Proprietary Mines.

Last year I [illegible] that the great hindrance to the progress [illegible] on this property was the [illegible] native labour. I am glad to say that the company has not suffered from this cause since then, with the result that there has been a considerable increase in the work done on the mine in all departments. The quantity of ore crushed, 303,400 tons was nearly 25 per cent. more than in 1914, and the working profit of £141,410 showed an improvement of £44,443. A small [illegible] in yield was much more than counterbalanced by the decrease in working costs of 2s. 10d. per ton to 21s. 6d. per ton. Had it not been for the effects of the war the costs would naturally have shown a still greater reduction. During the first five months of this year the working profit earned totalled £68,565, while the costs have averaged 22s. 1.5d. per ton milled. These profits have enabled the company to continue the payment of dividends at the rate of 10 per cent. per annum, and retain a substantial surplus for capital expenditure. The ample supply of native labour not only enabled the mill to be kept going at its full capacity, but made it possible to increase development, so that the consulting engineer was, in September last, able to recommend the enlargement of the plant to a capacity of 40,000 tons monthly. The funds necessary for this are available; they have been provided in part by the profits over and above the amount paid in dividends and in part by the exercise by your company of the option over 47,500 shares at 25s. per share which fell due in June of last year. Incidentally, it may be well to point out that the cost of the extension could have been somewhat reduced if it had not been the desire to lay it out in such a manner as to make still further extensions easy of execution. It is of course, too early to say when these will be taken in hand. Work in connection with the present increase of plant is proceeding, [illegible]owing to delays consequent upon the war, the additional stamps, etc., will not be dropped quite as early as I had hoped, but they are still expected to be in operation before the end of this year, though of course, under present circumstances, it is difficult to be positive on this point. It is hardly necessary to say it is anticipated that the profits will show a very material increase when the new plant is put into commission, not only because of the larger tonnage to be dealt with, but also, I trust, owing to a substantial decrease in working costs. The effect of the increased development footage was that the ore reserves at the end of 1915 were 200,000 tons higher than at the end of the preceding year. They totalled 2,100,000 tons of an average value of 7.7 dwts. over a stoping width of 50½ inches. Development continues to be energetically prosecuted in all sections of the mine, and will be further extended as faces become available. Some hindrance has been experienced from the large feeder of water which was met with in the No. 3 south drive in November of last year, the effects of which are still being felt.

May Consolidated.

As anticipated, the consulting engineer's estimate of February, 1914, that the total

remaining working profit to be earned would amount to from £8,000 to £10,000 has been considerably exceeded. Indeed, the profit for 1915 of £10,030 was nearly double that of 1914, and for the first five months of this year totalled £4,197. Provided the native labour position continues satisfactory, and no other serious difficulties are met with, work may continue until well into next year, though profits must be expected gradually to decrease. Operations at this mine are, however, subject to so many contingencies that this estimate must be accepted with caution. By far the most important asset of the May Consolidated is its holding of 28,875 shares in the Modderfontein Deep levels. Thanks mainly to the dividends received from that company, a distribution of 5 per cent. was made in respect of the year ended December last.

Princess Estate.

The hopes I entertained last year of an improvement in results have unfortunately not materialised. The working profit for the year was only £846. Sundry revenue totalled £4,123, while sundry expenditure came to £2,332; capital expenditure amounted to £13,107, but as the amount debited to working costs for development redemption was £6,378 more than the sum actually spent on development, the net liabilities of the company were only increased by £4,765, to a total of £15,132. The results since the end of last year up to April showed no improvement, the profit for this period totalling only £74. In May, however, thanks to a reduction in working costs due to a larger tonnage being dealt with and to a particularly clear month's running being obtained, the working profit earned was as much as £1,384. It is not yet possible to say whether this improvement can be expected to continue. The poor results obtained by the Princess Estate are largely due to the increase in costs directly attributable, at any rate as regards the major portion, to the war. Unfortunately, disappointing as these results are, their effect in connection with the development position is still more so, for owing to the precarious financial position of the company it has not been possible to do sufficient development to maintain the ore reserves, with the result that at the end of the year they stood at 488,000 tons, a decrease of 65,000 tons, the value being 6.7 dwts. over a milling width of 29.7 inches. The point has now been reached when it becomes necessary to consider the possibility of such a decrease in the ore reserves as to make it not feasible to continue crushing operations. An attempt to remedy this state of affairs would involve the provision of a large amount of money, totalling over £150,000. It is obviously out of the question to raise any such sum under present circumstances; consequently the company has had to decide to curtail development operations still further, in order to avoid any frittering away of money. Work on this basis can be continued for some time to come. Whether in the interval circumstances may change for the better remains to be seen, but it would certainly be premature to abandon all hope of improvement.

Mexico.

The political unrest in Mexico, from which our interests there have suffered so long, has continued in an accentuated form. How and when the situation will substantially improve no one can safely predict, but perhaps we have passed the darkest hour before the dawn, and there are at least signs in several parts of the Republic that work at mining properties and in industries is being resumed. At our chief interest, the La Fe Mine, pumping has continued steadily, but the resumption of active operations cannot yet be recommended owing to the political conditions in the neighbourhood of the property and the necessity for first seeing that supplies can be regularly secured and transported to the mine. Meanwhile we have the satisfaction of knowing that the company's plant is undamaged and ready to be started up at short notice when the general conditions permit, and that the price of silver, which will be the chief product, has considerably advanced.

General.

As we indicate in the annual report, Mr. W. McC. Cameron has since the beginning of the year resigned his position as our consulting engineer on the expiration of his contract. The loss of his valuable advice and services is a matter of great regret to the directors who fully appreciate their value. To him in a very large measure is due the present satisfactory position of the Geduld Proprietary Mines, while from the start of active operations he has had charge, as consulting engineer, of the Modderfontein Deep Levels, where he has left tangible evidences of his resourceful individuality in the manner of laying out and development of the property. We have been very fortunate in securing as Mr. Cameron's successor Mr. Benjamin Madew, who has had extensive experience here, and is well known on the Rand. Our staffs have, of course, been heavily depleted by many members joining the forces, and in other ways the war has led to several changes in our officers. The directors desire especially in this connection to express their regret at losing the valuable assistance of Mr. E. Coppee Thurston, who for several years acted as consulting engineer to the company in London, and who has left us to take up work for the Commission for Relief in Belgium. You will understand that the war has brought many difficulties and problems with it, and that administrative work connected with our activities, coupled with the reduction of our staffs by reason of the war, has been unusually trying. We are glad to think that this has been accomplished by a doubling of the gold output of our group of mines and by a considerable improvement of the company's position. The directors desire to express their full thanks to the staffs of the company here and at Home for the excellence of their services during the year.

The report and accounts were adopted, and the retiring directors, Mr. Joseph Timperley and Count Jean d'Arguesvives, were re-elected.

LEEUWPOORT TIN MINES.

The fourth ordinary general meeting of shareholders in the Leeuwpoort (African Farms) Tin Mines, Ltd., was held in the boardroom Jeppe Arcade, on June 15. Mr. Julius Jeppe, chairman of the company, presided, and amongst those present and represented by proxy were Sir Abe Bailey, K.C.M.G., M.L.A., African Farms, Ltd., Messrs. Alfred Barker, Berzson and Pakeman, J. S. Brown, W. E. Drummond, E. M. Hind, E. H. Lamb, Jas. McIntosh, E. Molyneux, W. Nelson, Geo. Parkes, Rhenoster Mines, Ltd. J. Hall Ryan, R. M. Saunders, Bailey Southwell, A. Woodrow, W. J. Gau, A. G. Gill, and O. F. Brotherton (secretary), representing in all 234,476 shares out of a total issued capital of 275,000 shares.

The Chairman said:—Gentlemen,—In view of the fact that the documents dealing with the operations of the company during the year 1915 have been in the hands of the shareholders since March last, and these documents include reports from the consulting engineer Mr. D. Wilkinson, and the manager, Mr. J. L. Jameson, explaining fully the different phases of the operations, it seems needless for me to further comment on the figures contained in the balance sheet and the profit and loss account. There are, however, some of the more important features in the documents to which I would like to draw your attention. You will, I think, agree with me that the working profit—namely, £18,200—made during the year under review can be considered quite satisfactory, remembering the abnormal conditions prevailing, and especially bearing in mind the fact that owing to the low price of the metal during the first six or seven months of the year the price obtained for your metallic tin produced during the whole year averages only £160 per ton. our ore reserves stood on the 31st December, 1915 at 107,100 tons, showing an increase of 17,375 tons over that of the previous year. If we express that increase interms of metallice tin we find that after having taken out of the mine during the year under review 41,384 tons of ore, which produced 582 tons of metallic tin, and after providing for the reduction of 0.26 per cent. metallic tin in the value of your entire ore reserves, we still show an increase of 137 tons metallic tin. Our consulting engineer, dealing with this point in his report, says: "As the method adopted is based over two years' experience, the tonnage may be considered reliable." To this I wish to add that this gratifying position is not alone due to development (as a matter of fact the first tive months of 1915 we did very little development), but to the "extraneous sources" yielding 34.66 per cent. of the total ore sent to the mill. I might perhaps be allowed to explain here shortly the meaning of the term "extraneous sources." The occurrence of ore is considered an extraneous source when the development performed reveals no indication of its presence. In other words, a given block of ground may have certain sections proved by development to be unpayable; however, if on stoping these sections become payable, they are considered an extraneous source. Again, extraneous sources of ore may result from a partial or complete duplication of the lode or an intrusion of an almost parallel lode or cross-fissure. Of course, the main point that affects us as shareholders is that ever since we commenced stoping we found that these extraneous sources supplied 22.90 per cent. of the total ore mined. This year, as pointed out in the manager's report, 34.66 per cent. of ore was obtained from this source. We are therefore justified by past experience in anticipating a continuation of this gratifying feature. Another pleasing element in the year's work is the substantial reduction of £7 13s. effected in the cost of producing a ton of metallic tin to which attention is drawn in the consulting engineer's report.

The Financial Side.

Dealing now for a moment with the financial position of the company, I would like to refer to the item "Sundry creditors," appearing on the debit side of your balance sheet amounting to £30,167, which constitutes your only liability. This shows a reduction during the year of £8,484. Since then further reductions have taken place, so that on the first of this month the amount stood at £18,200, against which there was owing to your company by the Straits Trading Company an amount of £8,535 for tin sold. In addition to this, there were 50 tons of the concentrates produced in May still unsold. We are therefore justly assuming that by the end of next month your company will be free of all liabilities. At the meeting held in June, 1915, I drew your attention to the additional plant required to treat pyritic concentrates. At that time we had exhausted our cash, and had therefore to make provisions for furnishing the money required for this plant, as well as for the purchase price of one portion of the farm Leeuwpoort. Your directors considered it advisable rather than issue debentures or increase the capital to borrow the money, and they were successful in obtaining an advance from the African Farms, Limited. On account of this loan we have repaid to that company up to the 1st of this month over £40,000 out of profits made, and we anticipate to liquidate this debt entirely by the end of next month. I feel sure that our decision to borrow the money rather than raise it in other ways will meet with the approval of the shareholders. It is true that it necessitated delay in the payment of dividends, but the benefits which shareholders will derive from this financial arrangement should fully compensate them for such delay. There is no necessity for any extraordinary capital expenditure in the near future. So the profits made from our operations from the 1st August should be devoted to the payment of dividends.

Result of Operations.

Now I will deal for a few minutes with the result of our operations since the beginning of this year until the 1st of the present month, on which the manager has just given us a short report, which I will quote in full:—"Sprnit Mine: The salient points in connection with underground work since the beginning of the present

year (1916) are as follows: (1) The present depth of the main incline shaft is 880 feet. At the resumption of sinking operations at 790 feet the values were poor but good values have reappeared at the present bottom of the shaft. We have every reason to expect a repetition of the occurrence of good values in lengthy chutes as previously experienced in sinking operations in this shaft. (2) The results of development work generally have been very encouraging, more especially the values located in the lowest drive, the 5th level north at 790 feet depth on the incline. (3) Hitherto practically no ore has been stoped from this working. Quite recently stoping operations have been started with very gratifying results, as regards both tonnage and values. At the South Spruit extension workings, which represent the southern extension of the spruit lode, the development disclosures on the third level (300 ft.) are very good. Both the north and south drives are in payable ore at present, and have already proved a substantial length of valuable stoping ground. (4) Applying our experience of development results on the lower level's of the spruit workings to this comparatively new working, it must be admitted that the existence of a large tonnage of good ore for stoping is practically assured. (5) At H. G. workings: The modified shrinkage and caving system adopted for stoping out the ore continues to be quite successful. A considerable tonnage of broken ore is still available, and is being drawn off monthly at a low cost. During the past few months a promising discovery of a "new" lode has been made on the 70ft. level—north section, which is being vigorously exploited. (6) Workings on the remaining mines, which are enumerated in the report, reveal nothing worthy of special note beyond the fact that development is being continued on them with satisfactory results, and that they continue to furnish their quota of ore. (7) At the west old workings (a new discovery not hitherto mentioned) three distinct occurrences of rich ore in lodes have been located by means of three adits. The whole occurrence is one of considerable promise, and at present the general character of the discoveries is not unlike the results obtained in the early history of the rich H. G. Mine, which is situated on the northern crest of the same hill. Plant: A preliminary trial run of the additional calcining, regrinding, and reconcentrating plant took place during April. The various units were started up without any hitch, and are now doing good work. During the latter half of the present month (June) coarser battery mesh screening will be in use in order to augment the tonnage milled monthly. Until this plant was in commission it was not possible technically to crush a greater tonnage (by means of coarser battery screening), owing to concentrating difficulties due to the limited plant available. The ultimate result of the inclusion of this new plant in the general scheme of concentration should be reflected in a larger tonnage of finished concentrates won of an enhanced grade each month."

A Sound Position.

From this report you will gather that the operations during the last five months have been most successful. We have produced during that period 424 tons of concentrates, sold for £47,791, and yielding a profit of over £14,000. Comparing this profit with those of the previous years I quote the following figures: In 1914 we made a net profit per ton of metallic tin sold £15 14s. 1.54d., in 1915 £31 5s. 9.69d., and during the first five months of this year £53 18s. 7d. In summing up the position of your company I would like to draw your attention to the opening and closing paragraphs in the consulting engineer's report, reading as follows:—"The results of the last year's operations are given in detail in your manager's report, and show an all-round improvement on those obtained during 1914. I beg to confirm the statement of your manager, that the outlook at the mine at the close of the year 1915 was better than at the close of the year 1914," as well as the remark made by the manager in his report, reading: "The mine generally is in a very sound position, and the outlook at the year end (1915) was distinctly more favourable in position, and the outlook at the year end I doubt whether shareholders sufficiently realise the magnitude and potentialities of your undertaking. We have already brought into the producing stage seven distinct mines or occurrences. We have proved that payable ore goes down to the 880 feet, to which depth we have so far sunk on the spruit lode. All the other workings show payable values to the depth they have been worked. Also, we have every reason to anticipate further new discoveries, such as the one lately made now called the west old workings. Your freehold farm Leeuwpoort is 8,396 acres in extent, and we have as yet been able to attack a very small portion of it. The mineral rights you have over 8,325 acres of the adjoining farm, Rietfontein, holds out considerable promise; and, lastly, we have a vast area of alluvial ground which will certainly sooner or later add to the company's output. We have not yet been able to tackle the matter dealing with the alluvial deposits, but our neighbours, the Rooiberg Minerals Development Company, Limited, are now seriously undertaking this treatment on their ground, and naturally the experience they gain will be of considerable use to us. In conclusion, I would like to express the directors' appreciation of the valuable assistance given by Mr. D. Wilkinson, your consulting engineer, and to thank our very able manager, Mr. J. L. Jameson, and the loyal staff under him for the energetic, zealous, and efficient manner in which the work was carried out during a trying but successful year. I may mention that a considerable proportion of our staff and employes have gone to the front on the usual terms, and I feel confident shareholders will object as little to this as the remaining members of our staff have objected to doing additional work.

The report and accounts were adopted.

Messrs. J. H. Ryan and W. J. Gau were re-elected to the directorate.

Messrs. Fraser and McKenzie and A. E. A. Williamson were reappointed auditors.

AFRICAN FARMS.

The fourteenth ordinary general meeting of shareholders in the African Farms, Limited, was held in the board-room, Jeppe Arcade, on June 15th. Mr. Julius Jeppe (chairman of the company) presided, and amongst those present and represented by proxy were: Sir Abe Bailey, K.C.M.G., M.L.A., Messrs. African Land and Investment Company, Limited, T. W. Armstead, Alfred Barker, Alfred Brooks, E. Coote, C. S. Cradock, J. G. Currey, A. S. Eastburn, J. Friedlberger, G. H. Gisson, H. H. Gibbs, H. Goldhe, T. H. Haggas, R. Hedding, E. M. Hind, H. G. Hipwell, E. A. Jackson, W. Kerrish, D. Lipinski, D. W. Lloyd, E. S. Marshall, G. Muller, C. H. Moore, C. Phillips, T. Portcous, J. H. Ryan, R. G. Schwarz, Skene and Thomas, R. Sleigh, B. Smithwell, A. C. Stone, G. H. Strutt, William Thomas, John Varley, W. W. Webb, W. W. Woodley, H. Zimmerman, A. G. Gill, W. S. Smits, E. Williams, and O. E. Brotherton (secretary), representing in all 188,612 shares out of a total issued capital of 649,631 shares.

Chairman's Speech.

The Chairman said: Gentlemen, The balance sheet and profit and loss account for the year 1915, to which is attached the directors' report, have been circulated to the shareholders in April last, giving ample time for study and scrutiny. In view of the full explanation given in the report on the different items of the accounts, it is needless for me to refer to them in detail. I shall therefore only draw your attention to one or two of the prominent features in the balance sheet and in the profit and loss account. From the former you will notice that after providing for the necessary depreciation and losses, totalling £1,572 (leaving out shillings and pence) we have made a net profit of £5,857. I need not remind you of the conditions prevailing during the year under review, which naturally affected all transactions in freehold. Looking at the credit side of the balance sheet, the change in your farm holdings occasioned by the purchase of 54 farms and the sale of five have already been explained in the directors' report, bringing the total area held by you in freehold to 1,361,166 acres and mineral rights to 223,196 acres. Your share investment stands at £13 56. The market value of this asset on the 1st of this month exceeded the sum of £173,000. The other items of the balance sheet requires no further mention, with the exception of Welgevonden Tin Mines, standing at £12,562 to which I will refer later on, sundry bonds and loans amount to £11,831. The main portion of this is made up by bonds for balance due on purchase price of farms. An amount of £23 63 owing by the Leeuwpoort Tin Mines, however is included in this total. This balance has been considerably reduced since January 1, and should be liquidated within a month or two. Taking now the profit and loss account, there are no items on the debit side requiring special comment. Particulars are given of the amount £1,572 written off on depreciation, to which I have already referred, and turning to the credit side I might remark, that our income from rents during the year under review is £736 more than the previous year. Against that our income from dividends is £4,596 less. This is due to the exhaustion and consequent liquidation of the York Mine, which had been a regular dividend producer for the last seven years. As you have no doubt noticed, we made a net profit of £1,815 on the farms sold, and on which we retained the mineral rights, and this I think finishes my review of the accounts. I shall be glad, however, to give any further explanation that may be required by shareholders.

The Year's Operations.

Speaking now generally on the operations of last year and the position of your affairs to-day, I think there is every reason to be satisfied. We cannot expect to do much business in abnormal times such as we have gone through, and which are still obtaining, but there is no doubt in my mind that when once this terrible war is ended an active demand for land will be created. It is true that, generally speaking, farming operations during the year under review have not been too successful. Drought and disease have again accounted for many disappointments and even failures, and it appears as if nature was fighting hard against successful occupation of the land. On the other hand, those who are best able to judge and speak share the conviction with me that it can only be a question of time and money and intelligent perseverance to bring a great portion of the Transvaal under beneficial occupation. I am glad to be able to tell you that as far as our own operations are concerned, although they have not yielded the return expected, we have had no abnormal losses in our herds of cattle or great setbacks in agricultural operations. Our various plantations have done quite well, and our herds continue to increase. I might perhaps here mention that no credit is taken in your accounts for increased number of head of cattle. Now with reference to your freehold farm Welgevonden, on which the tin mine of that name exists. Last year I told you that the directors had decided to close it down, pending an improvement in the condition of the tin market. Although during the latter part of the year under review the price of metallic tin has gone up considerably, it has not yet reached the figure at which your directors would consider the restarting of milling. In the meantime exploitation work is being carried on on a limited scale, and the plant is kept in perfect condition, ready to start within a week's notice. Another tin venture in which you are largely interested is the Leeuwpoort Tin Mines. The meeting of that company has just been held, and the proceedings of that meeting will be embodied in the documents which are to be forwarded to our shareholders. As you have observed, the directors' report and

the accounts have been already attached to the advance copy in your hands. I am sure you do not want me to repeat what I said from the chair at the meeting of that company. All I can add is my conviction that we have every reason to be satisfied with our investment in that direction, which promises to soon enter into the dividend paying stage. In conclusion, I would like to express the directors' appreciation of the good work performed by Mr. O. F. Brotherton, our able secretary, and the staff under him. A considerable proportion of this staff has gone into the fighting line. Some of them had to be replaced temporarily, but additional work devolved on those remaining, which is being cheerfully carried out.

The report and accounts were adopted.

Messrs. J. H. Ryan and J. Emrys Evans, C.M.G., were re-elected to the directorate.

Messrs. Alex. Aiken and Carter and H. C. L. Panchaud were reappointed auditors.

SOUTH AFRICAN GOLD MINES.

The annual general meeting of shareholders in the South African Gold Mines, Ltd., took place in the boardroom, Jeppe Arcade, on June 15. Mr. Julius Jeppe, chairman of the company presided, and among those present and represented by proxy were:—Sir Abe Bailey, K.C.M.G., M.L.A., Messrs. A. C. Arding, Alfred Barker, J. R. Bower, General R. Pole-Carew, F. C. Chapman, J. G. Currey, J. T. Davy, H. M. Eastman, E. C. Fitzherbert, W. Gilliland, T. H. Haggas, R. Hedding, E. M. Hind, W. Kentish, T. Kettlewell, Emile Lefebvre, C. H. Miller, R. G. Morgan, W. Nelson, Sir A. J. Newton, J. Pickard, G. H. Rennie, J. H. Ryan, W. Sanderson, Wm. Simpson, Skene and Thomas, R. Southwell, T. W. Twyford, John Varley, F. Walters, G. H. Winstanley, J. Emrys Evans, C.M.G., and O. F. Brotherton (secretary), representing in all 36,204 shares out of a total issued capital of 179,324 shares.

The Chairman said:—Gentlemen.—There is little I can add to the explanation given in the directors' report of the balance sheet and profit and loss accounts. These have been in your hands since April of this year and if you require any further elucidation on any of the items appearing in the accounts I shall be glad to give them. In the meantime there are just one or two points which I might draw your attention to. You will notice that your debenture debt remains the same as the previous year, namely, £38,470, as we have been unable to purchase any. On your asset side the item of claims and mining ventures has been increased by £707 (I will leave out shillings and pence in my references) which has been devoted to the purchase of an interest in certain bewaarplaatsen, which investment promises to be a profitable one. Your asset on shares has been increased by an amount of £4,831. We have sold very few shares, but have purchased some more which accounts for the increase. It has been necessary to write only £181 off the value of this asset to bring certain shares down to their market value on the 31st of December. There is further a considerable appreciation shown on to-day's market value of the entire asset. Your cash account shows an increase of £8,820, nearly all of which is out at short loans at fair interest and fully secured. Finally, the year's business has resulted in a net profit, after paying interest on the outstanding debentures and providing a small sum for depreciation on shares already mentioned, of £15,490, leaving a balance standing to the debit of the profit and loss account of £38,650.

The report and accounts were adopted.

Mr. Julius Jeppe, Sir Abe Bailey, K.C.M.G., M. L.A., and Messrs. J. H. Ryan, J. Emrys Evans, C.M.G., and B. Southwell were re-elected directors.

Messrs. C. L. Andersson and Co., and J. P. Ablett, F.C.P.A., were reappointed auditors.

New Patents.

104. John Bellingham.—Improvements in concrete building slabs and moulds therefor.
110. Thomas Henry Peters.—Improvements in means for transporting broken rock and other material in mine workings.
111. Leslie Hamilton MacCallum.—Means for locking mechanisms for alternative movement.
112. George Green.—Improvements in security apparatus for wheels or pulleys to shafts.
113. James Rayney Leach Allott and Ernest Dean.—Improvements in means for arresting vehicles on inclined railways.
114. John Patrick Ferriter and Thomas Jefferson Peters.—Improvements in transparent slides and processes of making the same.
115. William Blanks.—Improvements in linings for the ends of tube mills.
116. Rhodesian Enterprises, Ltd., and Horace Laurence Sharpe.—Improvements in and relating to means for the application and transmission of motor power to bicycles and other light road vehicles, small lathes, drilling, sewing and other light machines.
117. Marks Harris and Adolph Brodie.—Improvements in the construction of wooden bedsteads.
118. Frederick Charles Hendricks and John Henry Theunissen.—Funer
119. Reginald Shadforth Scott.—A new or improved dropper for farm and other fencing.
120. Ernest Robert Godward.—An improved carburetter.
121. John Henry Widdicombe Scott.—New and improved folding and collapsible military, naval and service cap.
122. James Valentine Standgra—.—Method of producing ammonia and by-products.
123. Kenneth Bertram Lamont.—Cam shaft pulley or driving pulley and cam fasteners.
124. Edward Royal Holden.—Improvements in the treatment of ores.
125. Edward Royal Holden.—Improvements in and relating to apparatus for separating ores.
126. George Lindsay Johnson.—An unsinkable and non capsizable life saving boat raft.
127. Alexander Charles Letchford.—A new or improved distemper or water paint.
128. Arthur Edwin Leigh Scaues and The British Westinghouse Electric and Manufacturing Co., Ltd.—Improvements in or relating to pumps or compressors.
129. Sidney George Jones, Frank Ernest Wilson and Walter Arnold Shepherd.—Improvements in or relating to the control of electric fan motors.
130. David Ewart Rennie.—Improvements in rope-rollers.
131. Benjamin Waites and Minnie Waites.—Improvements in the classification, concentration and separation of ores, minerals, clays, alluvial deposits or other loose, fragmentary, granular or pulverulent material, and in apparatus therefor.
132. Francis Henry de Sueur.—Improvements in devices specially adapted for the use of miners and others for purifying or removing dust from the air before it is inhaled, and also applicable for inhalation for medicinal and other purposes.
133. Richard Skinner.—A new or improved tool or device for the use of miners and others who engage in blasting operations.
134. Henry Peterson.—Improvements in rollers and the like for supporting ropes in mine shafts and haulage tracks and the like.
135. Frederick William Hobbs, Arthur Harry Moore and Harold Vincent Moon.—Improvements in acetylene gas generators and lamps.

American Export Trade Preparations.

The American International Corporation, which is described as a combination of the most influential manufacturing, railway, mining, engineering, and banking concerns in the United States, formed apparently with the purpose of promoting the American export trade, announce that, although it has hardly begun operations as yet, important Central American, South American, Chinese, and South African proposals are already under consideration. The Corporation has a capital of £10,000,000, and, if need arises, purposes to carry on almost any kind of business enterprise and to acquire almost any kind of property.

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